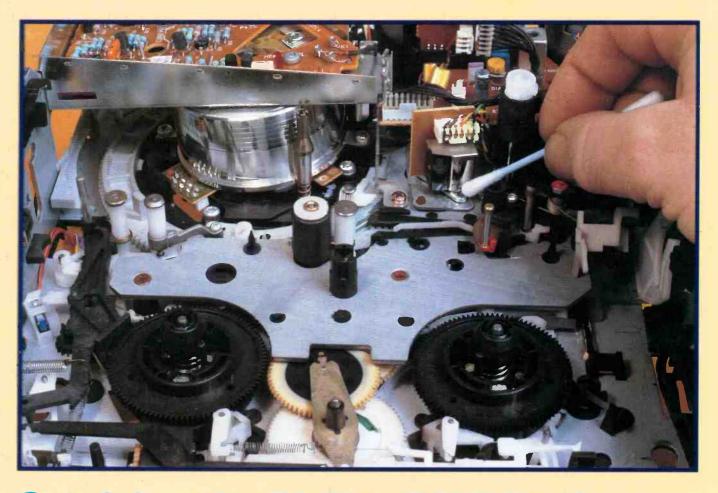
MARCH 1992

£1.95

TELEUISION

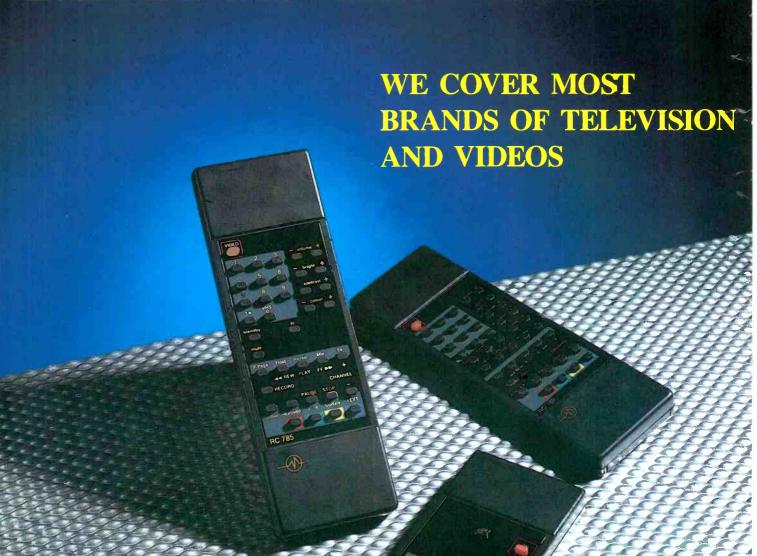
SERVICING-VIDEO-SATELLITE-DEVELOPMENTS

WIN AN FM/MW/LW RADIO FREE 32-PAGE CATALOGUE



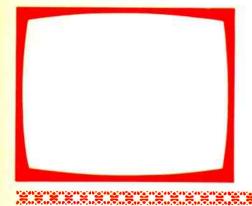
Servicing the Philips DMP Deck Continuity Tester/Low-R Ohmmeter More on the Finlux 1000 Chassis Satellite TV Notebook•DX-TV VCR Clinic•TV Fault Finding

REPLACEMENT REMOTE CONTROLS?





FOR FURTHER INFORMATION, INCLUDING CUSTOM DESIGNED UNITS CONTACT PHILEX OR AN AUTHORISED DISTRIBUTOR



TELEVISION

March 1992 Vol. 42, No. 5 Issue 497

On sale February 19th

COPYRIGHT

© Reed Business Publishing Ltd., 1992. Copyright in all drawings, photographs and articles published in *Television* is fully protected and reproducution or imitation in whole or in part is expressly forbidden. All reasonable precautions are taken by *Television* to ensure that the advice and data given to readers are reliable. We cannot however guarantee it and we cannot accept legal responsibility for it.

CORRESPONDENCE

All correspondence regarding advertisements should be addressed to the Advertisement Manager, "Television", Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Editorial correspondence should be addressed to "Television", Editorial Dept., Reed Business Publishing Group, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

INDEXES AND BINDERS

Indexes to Vols. 37 and 38 are available at £1 each from the Editorial office (address above). Photostats of the indexes to Vols. 31-36 can be supplied at £1 each. Make cheques etc. payable to Reed Business Publishing Ltd.

Binders that hold twelve issues of *Television* are available for £5 from Television Binders, 78 Whalley Road, Wilpshire, Blackburn BB1 9LF. Make cheques out to "Television Binders".

SUBSCRIPTIONS

An annual subscription costs £23 in the UK, £28 overseas (by surface mail – ask for airmail quote if required). Send orders with payment to Quadrant Subscription Services Ltd., Oakfield House, Perrymount Road, Haywards Heath, Sussex, RH16 3DH.

Subscription hotline for 24-hour ordering with Credit Card number 0789 200 255.

BACK NUMBERS

Subject to availability, copies of issues published during the last 12 months are available at £2·50 each from Television Back Issues, Room L333, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Make cheques/postal orders payable to Reed Business Publishing Ltd.

QUERIES

We regret that we cannot answer technical queries over the telephone nor supply service sheets. We will endeavour to assist readers who have queries relating to articles published in *Television*, but we cannot offer advice on modifications to published designs nor comment on alternative ways of using them.

this month

319 Leader

330 Continuity Tester/Low-R Ohmmeter

Ian Rees

Many DMMs have poor performance in the low-ohms range. This meter was specifically designed for the application.

332 Teletopics

News, comment and developments.

334 What a Life!

Donald Bullock

336 Servicing Philips DMP VCR Decks

Large numbers of Philips and other VCRs use this unique deck. Notes on common problems and servicing

procedures, also some electronic faults with Philips models.

Nokia's Approach to Widescreen TV

By leaving out 1,250-line operation and other features Nokia has substantially reduced the price of widescreen TV sets.

341 Long-distance Television

Roger Bunney

George Cole

DX conditions and reception and news from abroad.

342 Photostat Service

343 New Reader Service Numbers

344 TV Fault Finding

Reports from Philip Blundell, AMIEIE, Alfred Damp, Steve Cannon, Ed Rowland, John Edwards, Stephen Leatherbarrow, Brian Storm and Chris Avis.

347 CD Player Casebook

Reports from Mick Leach, P.J. Roberts and Nick Beer.

347 Matters Arising

348 Test Report: Beckman Industrial RMS225 DMM

David Botto

A thorough assessment of this new DMM which offers numerous features for its very reasonable price.

352 VCR Clinic

Reports from Philip Blundell, AMIEIE, Eugene Trundle, John Edwards, Brian Storm, Michael Dranfield, Stephen Leatherbarrow and Brian Davidson.

354 Competition - Win an FM/MW/LW Radio

355 Overhauling Valve Radio Receivers

Stanley Jackson

Many modern engineers have never dealt with valve equipment. A quick guide on how to deal with a faulty valve radio set.

356 Letters

359 Next Month in Television

360 Satellite Notebook

Nick Beer

Fault notes and problems that arise with satellite TV installations.

361 More on the Finlux 1000 Series Chassis

Chris Watton

Fault notes and procedures for dealing with defective sets.

363 Test Case 351

OUR NEXT ISSUE DATED APRIL WILL BE PUBLISHED ON MARCH 18

AAY32 AAC107 AAC125 AC126 AC127 AC128 AC127 AC128 AC141 AC186 AC18
BO
60p 60p 30p 30p 50p 28p 30p 31p 30p
BTY79
140p 140p 180p 180p 180p 180p 180p 140p 110p 140p 150p 150p 150p 150p 150p 150p 150p 15
TIP150 TIP151 TIP2955 TIP3054 TIP3055 TIS44 TIS61 TIS90 TIS91 TIS93 VK1010 VN10KM
400p 122p 22p 22p 22p 22p 22p 22p 22p 22p 2
OA47 OA491 OA47 OA491 OA47 OA491 OA47 OA491 OA202 OA47 OA491 OA202 OA47 OA491 OA202 OA47 OA491 OA202 OA47 OA47 OA47 OA47 OA47 OA47 OA47 OA47
5p 6p 6p 7p 7p 7p 7p 10p 10p 112p 112p 113p 118p 118p 118p 118p 118p 118p 118
PCF801 PCF802 PF183 P
5mm 5p 8p 8p
AN7145 AN7146 AN
800p 110p 190p 190p 190p 190p 190p 190p 1
ICL7106 ICL7606 ICL7611 ICL7660 ICL76611 ICL7660 ICL76611 ICL7660 ICL76611 ICL7660 ICL76611 ICL7660 ICL76611 ICL7660 ICL76611 ICL76611 ICL7660 ICL76611 ICL76611 ICL76611 ICL7612 ICC7612 ICC7
45p 40p 18p
LM3909 LM3911 LM39131 LM3916 LM39116 LM39116 LM39116 LM39116 LM39116 LM39116 M501115P M501119P M501119P M501130P M50130P M50130P M50130P M50130P M50130P M51301P M5130
• 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850- 6 6850
STK436 STK437 STK437 STK437 STK437 STK437 STK4437 STK4437 STK4437 STK4437 STK4438 STK4438 STK4483 STK4483 STK4483 STK4683 STK6833 STK6
500p 500p 680p 1 200p 1 200p 680p 680p 680p 680p 680p 680p 680p 6
STK7226 STK7308 STK7308 STK7308 STK7310 STK7310 STK7310 STK7366 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STK7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR7406 STR
580p 680p 680p 330p 330p 330p 330p 330p 330p 330p 3
TA7310 TA7310 TA7312 TA7312 TA7312 TA7312 TA7312 TA7312 TA7313 TA7314 TA7314 TA7315 TA7314 TA7315 TA7312 TA7312 TA7328 TA
65p 40p 120p

TDA1420	2500	300	2SC3787 100p 2SD-921 320p 2SD-1273 100p 2SD-1455 320p 2SC-3789 75p 2SD-923 360p 2SD-1275 160p 2SD-1457 220p 2SC-3789 120p 2SD-936 100p 2SD-1275 100p 2SD-1457 220p 2SD-1458 120p 2SD-1558 120p 2SD-1558 120p 2SD-1558 120p 2SD-1559 100p 2SD-1458 120p 2SD-1558 120p 2SD-1559 120p 2SD-155
TDA1540 A200 TDA5560 TDA5560 TDA5560 TDA5570 TDA5570 TDA5570 TDA5770	380p 25A550 150p 25A1380 25A550 450p 25A1380 25A562 50p 25A1381 25A560 300p 25A1381 25A560 300p 25A1381 25A560 300p 25A1381 25A560 300p 25A1382 25A560 300p 25A1385 25A560 300p 25A1385 25A560 300p 25A1463 25A560 300p 25A1489 300p 25A560 3	Nop 25C1030 90p 25C1821 60p 25C2547 65p 25C3153 320p	25C3887 260p 25D-1012 60p 25D-1348 85p 25D-1604 200p 25D-25C3883 260p 25D-1021 20p 25D-1348 85p 25D-1608 20p 25D-25C3883 20p 25D-1022 400p 25D-1350 150p 25D-1609 20p 25D-25C3895 20p 25D-1031 20p 25D-1350 25D-1609 20p 25D-25C3895 20p 25D-1031
TDA2030 800 TDA8163 TDA2030 800 TDA8163 9000 TDA8163 9000 TDA8170 TDA8163 7500 TDA8173 TDA8173 3000 TDA8173 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500 7500	1506	Opt 25C1172 30p 25C1386 80p 25C2811 40p 25C3286 500p	25C4422 260 25C4262 500 25C1207 50p 25C1430 280p 25K-55 100p 25C4262 50 25C1207 50p 25C1430 40p 25K-68 100p 25C4261 50p 25C1430 40p 25K-68 100p 25C4261 50p 25C1430 40p 25K-68 100p 25C4261 50p 25C1201 120p 25C1430 750p 25K-134 415p 25C1200 210p 25C121 120p 25C1430 750p 25K-134 415p 25C1200 210p 25C1229 250p 25C1235 100p 25C1430 750p 25K-135 415p 25C1200 25C1229 250p 25C1238 100p 25C1430 750p 25K-135 110p 25C1230 20p 25C1229 250p 25C1238 100p 25C1430 750p 25K-135 110p 25C1235 100p 25C1230 100p 25
TDA2592 130p TL084 TDA2590 170p ULN2002	55p 25A979 85p 25B376 70p 25A984 50p 25B576 70p 25A984 50p 25B586 65p 25A1006 120p 25B586 170p 25A1008 125p 25B586 170p 25A108 125p 25B586 170p 25A108 125p 25B586 170p 25A1012 125p 25B596 170p 25A1012 125p 25B596 170p 25A1012 100p 25B598 170p 25A1012 100p 25B598 170p 25A1013 100p 25B598 170p 25A1015 30p 25B598 170p 25A1015 30p 25B598 170p 25A1016 40p 35B646 170p 25A1018 100p 25B647 170p 25A1021 60p 25B649 170p 25A1021 60p 25B649 170p 25A1021 60p 25B649 170p 25A1021 60p 25B716 170p 25A1028 60p 25B716 170p	Section Sect	\$250424 \$400
TDA3047 200p UPC1026 TDA3082 300p UPC1026 TDA3082 300p UPC1031 TDA3083 250p UPC1032 TDA3190 100p UPC1137 TDA3301 800p UPC1137 TDA3301 120p UPC1183 TDA3301 120p UPC1183 TDA3301 120p UPC1183 TDA331 120p UPC1183 TDA340 250p UPC1183 TDA3502 600p UPC1183 TDA3503 600p UPC1183 TDA3503 600p UPC1183 TDA3504 600p UPC1183 TDA3505 300p UPC1183 TDA3506 300p UPC1183 TDA3506 300p UPC1282 TDA3506 200p UPC1282 TDA3501 200p UPC1282	95p 25A1060 150p 2587/3 90p 25A1069 150p 2587/3 90p 25A1069 150p 2587/3 90p 25A1069 150p 2587/3 90p 25A1077 30op 25A1081 80p 25A1081 80p 25A1081 90p 25A11281 90p 25A1281 90p 25A128	99 2SC1450 200p 2SC2228A 60p 2SC2793 700p 2SC3416 80p 2SC3793 700p 2SC3416 80p 2SC3793 32p 2SC3808 40p 2SC3437 90p 2SC3437 30p 2SC3437 90p 2SC3437 400p 2SC2233 100p 2SC3431 40p 2SC3431 20p 2SC3431 40p 2SC3431 40p 2SC3431 40p 2SC3432 110p 2SC3431 40p 2SC3432 100p 2SC3431 40p 2SC3431 40p 2SC3432 100p 2SC3431 40p 2SC343	250640 350b
TDA3565 300p UPC1278 TDA3565 330p UPC12788 TDA357180 675p UPC1288 TDA35766 400p UPC1388 TDA3586 750p UPC1388 TDA3586 750p UPC1388 TDA3581 450p UPC1352 TDA3581 450p UPC1352 TDA3581 200p UPC1352 TDA3581 200p UPC1352 TDA3663 150p UPC1364 TDA3761 320p UPC1370 TDA3761 320p UPC1370 TDA3761 400p UPC1376 TDA3741 400p UPC13872 TDA3781 400p UPC1376 TDA3783 550p UPC1377	230p 25A1133 200p 25C461 230p 25A1141 350p 25C491 320p 25A1141 350p 25C491 320p 25A1142 450p 25C498 320p 25A1145 450p 25C498 315p 25A1152 150p 25C515A 400p 25A1156 150p 25C515A 250p 25A1168 500p 25C536 300p 25A1168 500p 25C536 300p 25A1168 500p 25C636 300p 25A1188 500p 25C636 300p 25A1188 500p 25C638 300p 25A1186 500p 25C638 300p 25A1186 500p 25C638 300p 25A1186 500p 25C643 25A1210 100p 25C643 25A1210 100p 25C644 210p 25A1210 120p 25C644 245p 25A1210 120p 25C638 25A1210 120p 25C631 25A1210 120p 25C711 25A12271 120p 25C711	Op 28C1580 600p 25C2307 500p 28C2311 120p 28C1306 600p 28C2308 40p 28C2318 230p 28C2309 60p 28C2318 230p 28C2309 60p 28C3309 780p	25D 768 2 800 972 PO
TDA3810 300p 1403CA 17DA3950 300p 1403CA 17DA4950 250p 1420CA 17DA4950 250p 1420CA 17DA4262 400p 1420CA 17DA4282 180p 1420CA 17DA4426 250p 15MCA 17DA4431 200p 15MCA 17DA4431 200p 15MCA 17DA4431 200p 15MCA 17DA4431 250p 15MCA 17DA4431 250p 15MCA 17DA4431 250p 17DA431 250p 17DA431 450p 17DA431 450p 17DA431 450p 17DA439 150p 17DA431 450p 17DA439 150p 17DA	750p 2SA1232 275p 2SC730 2SC730 2SA1242 80p 2SC732 2SA1244 120p 2SC732 2SA1244 120p 2SC732 2SA1244 120p 2SC733 2SA1241 150p 2SC738 2SA1241 150p 2SC738 2SA1241 150p 2SC738 2SA1241 150p 2SC739 2SC732 2SA1241 2SA1245	Op 2SC17444 40p 2SC2373 210p 2SC3025 500p 2SC3657 400p p 2SC17441 45p 2SC2383 50p 2SC30265 500p 2SC3655 600p p 2SC1756 50p 2SC2383 45p 2SC3030 750p 2SC3685 120p p 2SC1756 50p 2SC3481 13p 2SC3368 12p 2SC3785 13p 2SC3785 13p 2SC3785 20p 2SC37785 20p 2SC3778 20p 2SC3778 20p 2SC3778 20p 2SC3789 20p 2SC3788 36p 2SC3888 380p 48p 2SC3888 380p 48p 2SC3789 20p 2SC3888 380p 2SC3888 380p 2SC3888 380p 2SC3888 380p 380p 380p 2SC3889 2S00p 2SC3888 380p 380p 380p 2SC3889 380p 2SC3888 380p 380p 380p 380p 380p 380p 380p	150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150 150

TELEVISION MARCH 1992

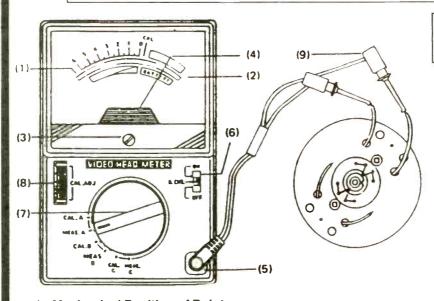
V/19725830	SDD (10 in box)
FVHP930 £32.00 NV386 £18.50 AKAI V180 £25.00 NV380 £18.50 AKAI V180 £25.00 SQ145KUVH1221WCP4000VCP4100 VCP4200	
800 3HSSDB £19.00 VS390, VS900, VS9	
VCP4200 £18.00 NV850NV950 £38.00 V3244, V5245, V5247, V5248, V5515, K5116, V5126, K5122, V516, V5126, K5122, V516, V5126, K5126, V5124, V5245, V5247, V5248, V5515, V516, V5126, K5126, V5124, V5245, V5247, V5248, V5247, V52	
	SDD (10 in box)
1241GHVP1247/1248VCP400 £17.50 NVG30NVG31NVG130 £38.00 VS516 £20.00 VS201, VS301, VS301, VS303, VS304, VS603, VS304, VS603, VS304, VS603, VS304, VS603, VS304, VS604, VS603, VS304, VS603, VS603, VS304, VS603, VS304, VS603, VS603, VS603, VS603, VS603, VS60	Name £11.00 Branded Name £2.10
4000H-4001H4002H £16.00 VXG104VG114VG15WVG15WVG15WVG15WVG15WVG15WVG15WVG15W	D Branded Name £2.50
STIDES E21.50 WG18 E30.00 MG18 E30	
NVGSOVVC# 53.000 VCR3000 €2.50 HR33UJ HR33SU HR33SU, HR33SU HR33SU, HR33SU HR3SSU HR33SU HR33SU HR33SU HR3SSU HR3SU HR3SSU HR3S	* * * * * * * * * * * * * * * * * * *
493549437496349854993/1H48334935/ 149854993	FOR AMSTRAD *
492049274930	,4600,4700 620p * * * * * * * * * *
TR4994 £23.00 NEC. 3V45, 3V46, 3V48, 3V53, 3V45, 3V45, 3V55,	
VS400410440450460500505510 £17.00 NS015NS016NS01ANS02ANS0037 FV10, FV11, FV12, FV14 £2.50 HR7700 £0.77	SERVICE KITS
VXL2VXXL2VXL26VXL25VXL25 £13.00 N906A £20.00 PVHP20, FVHP500 FVHP500 FVHP510 FVHF510 F	Each Kit Contains Its Set, Pinch Roller,
VXL6 £18.00 PCV/34PV2300PV2400PV/050 FVHP/22, PVHP/23, PVHP/23, PVHP/30 £3.20 HRD565, HRD566,	ion Band & Idler Tyres
HITACH N.994/NS9 / N.994/	
640/5030	
V735-V738-V739 (73.0)	
\(\text{V13000}\) \(\text{E10.00}\) \(\text{V164V/1654V1655V1055V2005}\) \(\text{E10.00}\) \(\text{V15000}\) \(\text{V160V3000}\) \(\te	£6.25p
VT77/880/3000/6500/7000900009300	
1730/190/1569/157	ERGUSON
V1250V1255 £29.50 V502V503V5005 £37.00 HR300, HR3330, HR3360, HR3660, NV2000 £1.50 3V2930	8-39 £5.50p £6.25p
VT150	11/120/225 £5.50p
HM.V. VH1000(ALL MODELS) £13.00 HRD110, HRD120, HRD121, HRD120, HRD121, HRD120, HRD120	£6.25p
VR6420 VR6520 VR69204R69204R692 VR6920 VR6	21
VR3605-3905/9395-3943/3954-3985/3993	
VR3979 E8.00 VR6642 £14.00 NATIONAL 450, 460, NV465, 600, 630, 730,	, 10.20p
TVC 3HSS RAXK BV990AS N8396 ARV320RV330V N8396 ARV320RV320V N8396 ARV320RV320V N8396 ARV320RV320V N8396 ARV320RV320V N8396 ARV320RV320V N8396 ARV3	
HR3860HR4100 £6.50 NV330, NV810, NV830, NV850, NV85	KIT £5.50
23928903890189028903 MR100 £17.00 NV8900 NV7900, NV7900, NV7900 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$1.700 \$	
JVC 3HSSL PIN 2A102A702B20 £23.00 NVG21, NVG25, NVH65 £3.20 SANYO HITACH	II T.V.
HR7700HR0110-HR0120 6106-70 633.00 FIRST 23.00 FIRST 25.50 VTC5000 60.75 OUTPUT I HR0123-HR0120-HR0130-9 FISS 0 VTC5000 51.05 OUTPUT I HR0123-HR0120-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-HR0130-	MODULE HM 6251
FERGUSON 3HSSL PIN CVR6083 VR6006 VR6003 VR6008 VR6008 VR6003 VR6008 VR6003 VR6008 VR6	0551 £6.50
30/24/3/3/49/56/3/56/3/56/3/56/3/56/3/56/3/56/3/56/	ERVICE AIDS
HRD140HRD143HRD150HRD157 HRD159HRD157 HRD709VHS005 FR011VHR019 (TCM10, YTCM10,	OL PRODUCTS
FERGUSON VERSC34VR504V4704VV VERSC34VR504V4701V V VC385, VC386, VC380, VC3300, VC3300, VC300, VC381, VC383, VC388,	
30/47/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/20/52/05/05/05/05/05/05/05/05/05/05/05/05/05/	GREASE 150p
3/43 3/43/53 £31.50 SAISHO VC681, VC681, VC783, VC773, VC7	
99.5099403V795V30 E10-00 V100VR65VR109V1909 E13-50 SONY C9300, VC9300, VC9500 E1.35 ANTI-STA	TIC 140p
JVC W82200VR3500 £16.00 SLC9, SLC24, SLC24, SLC24, SLC30, SLC33, SONY AERONLE	
HRD256-566 £24.50 SALORA \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90, \$1.90	SEAL 130p
BR7000EHR700DS	LEANER 130p vou purchase more
HRD520 £22.00 VT5600VX510VX510VX510VX510VX510VX510VX510VX5	han one Servisol
33/32/8842/HR7855 £23.00 \$ANYO \$3.40 £1.20 TOSHIBA Pri	oduct postage will be £2.00
HRD250 9769-V13H-HRD4304RD470 £31.00 VPREXDBWTC15804VTCM10VTCM11V VS9300 £1.60 V55, V57 £0.85 HRD250 PREXDBWTC15804VTCM10VTCM2VTCM2SVTC200	
KENWOOD	*****
KV917	NIVERSAL * FRIPLERS *
VR960 677.00 VC9350VTC9355VTC9555VTC9555 679.00 VC98520 621.00 VG8520 621.00 V9600 60.85 * * * * * * * * * * * * * * * * * * *	450p *
COLORE C	****
UNOR VHR1500VHR2500 £28.00 3V23 £0.85 ANTEX XS25W 240V	
MATSUI VS500AV850AV550AV550AV550AV550AV550AV550AV	******
VX880AVX730BVX773B £13.50 VC388VC482VC482VC485VC3300V 33V33 3V33 £0.80 Spare Element for XS25W \$\psi \cdot \text{XS25W} \\ \text{VC388VX730} \\ \text{C0.65} \	NY ONOFF *
\(\text{VX735AVX755}\) \(\text{VX755AVX755}\) \(\text{VX75AVX755}\) \(\text	WITCHES *
MITSUBISH VC6000VC8200VC8300VC7300/ VC7700VC7750VC8000VC8300VC7300/ VC7700VC7750VC8000VC8300V E31.00 Sp31, FV12, FV13, FV12, FV13, FV14 E1.40 Spare Element for C15W ± * * *	* * * * * * * * * * * * * * * * * * *
HS306HS318HS710	
18330	******
HS300HS301HS302HS310	NY THYRISTOR ,
HS337/HS347	G264A 600p
NATIONAL PANASUNIC VESSY VISSYS VIVO VIVO VISSYS VIVO VISSYS VIVO VISSYS VIVO VISSYS VIVO VISSYS VIVO VIVO VISSYS VIVO VISSYS VIVO VISSYS VIVO VISSYS VIVO VISSYS VIVO VIVO VISSYS VIVO VIVO VISSYS VIVO VIVO VIVO VIVO VISSYS VIVO VISSYS VIVO VIVO VIVO VIVO VIVO VIVO VIVO VIV	SG613 1000p
NV7800NV7850NV322NV332NV340 V85V86V87 £14.00 HTTACHI 1.VT33 £1.00 SOLDER MOP £0.65p	
NV8170AVV82004VV8400	
NV777/AV330 £17.00 V8600V8700 £38.00 V78500 £0.60 NV430 £14.25 TRIUMPH V79300 £0.60 18 SWG 500g £5.00p	PHILIPS
	SWITCHES
SEE PREVIOUS PAGES FOR MORE SOLDERING IRON STAND * K3C	150p * 0, K35, K40, KT3, KT4 *
OF THE REPORT OF THE PROPERTY	J, N35, N40, N13, N14 *
← GRANDATA BARGAINS Soldering Stand Spare Sponge £2.60p ★ ★ ★ ★	

IDLERS & PULLEYS REPLACEMENTS AMSTRAD Reference				IDLERS & PULLEYS REPLACEMENTS — Cont.				VIDEO MOTORS				
VCR7000		150280	£1.50	NATIONAL N/322, N/600, N/688, N/777, N/788	IDLER UNIT	VXP0463	£3.00	AMSTRAD VCR 7000	REEL MOTOR	£17.00		
VS1-2, VS4-5, VS15	FF-REW IDLER	M1327773	£4.50	NV333 NV333, NV366	IDLER ARM IDLER UNIT	VXL0997 VXP0401	£3.60 £0.75	FERGUSON & JVC PU 45979, 3V16, 3V22, HR3300, HR3660	CAPSTAN MOTOR	£21.00		
VS1-2, VS4-5, VS15 V9700 VS125, 126, 155,	T-UP IDLER IDLER IDLER ASSY	BV327815 BV321979 MZ366960J2	£6.00 £6.00 £11.00	NV333, NV366 NV333, NV3000	PLAY IDLER ACTION GEAR	VXP0433 VDG0016	£3.00 £0.60	PU 55371V, 3V35, 3V36, 3V38, 3V39, 8943, 8944, HRD110, HRD120, HRD121,	CAPSTAN MOTOR	£19.50		
VS165, 240, 244, VS245, 247, 248,	IDEEN AGGI	W1230030032	211.00	NV333, NV2000, NV3000 NV7800		VXP0325	£2.00	HRD225 PU 46414, 8904, 8922, HR3300, HR3320, HR3330, HR3360, HR3600, HR3660	DRUM MOTOR	£19.50		
VS250, 512, 515, 516				NV333, NV2000, NV3000 NV333	CAM GEAR	VXG0158	£0.65 £1.00	PU 51381V, 3V39, 3V30, 8930, HR7200, HR7300	REEL MOTOR	£26.50		
FERGUSON				NV366 NV370, NV430, NV730, NV830, NV850, NV870.	IDLER ARM IDLER ARM	VXL0997 VXP0521	£3.60 £1.70	PU 58635V, 3V58, 3V59, 3V64, 3V65, 8950, 8951, FV10B, FV11R, FV12L.	CAPSTAN MOTOR	€29.00		
3V16-22 3V16-22	T-UP IDLER T-UP IDLER	PU47752 PU49280	£4.50 £6.30	NVG7, NVG10, NVG12, NVG18				FV13H, FV20B, FV21R, FV22L, HRD170, HRD480, HRD230, HRD370, HRD430				
3V23, 3V29-30, 3V31-32, 3V35	REEL IDLER	PU48967	£3.00	NV370, NV430, NV870, NV730, NV830, NV850	CAM GEAR	VDG0200	£1.20	PU 58636W, 3V58, 3V59, 3V64, 3V65, 8950, 8951, FV10B, FV11R, FV12L,	REEL MOTOR	£18.00		
3V23 3V29-30, 3V31-32, 3V35-36, 3V38-39, 3V49	ROLLER ASSY T-UP IDLER	PU49042A 51402	£4.00 £1.45	NV730 NV2000, NV3000	IDLER UNIT	VXP0581 VXP0331	£2.50 £1.20	FV13H, FV14T, FV20B, FV21R, FV22L, HRD170, HRD180, HRD230, HRD370, HRD430, HR0530				
3V29-30,3V31-32 3V35-36, 3V38-39, 3V49	T-UP CLUTCH	PU51380 PU55374	£2.60 £2.85	NV2000, NV3000 NV2000, NV3000	IDLER UNIT CAM GEAR	VXP0329 VDG0069	£1.20 £1.00	3V43, 3V44, 3V45, 3V48, 3V53, 3V54, 3V55, 3V56, 3V57, 8945, 8947	LOADING MDTOR	28,00		
3V35-36, 3V38-39, 3V49 3V58-59, 3V64-65,		PU55373 PU58645	£2.25 £2.50	NV2000, NV3000 NV7000, 7200, 7800	ACTION GEAR IDLER UNIT	VDG0016 VXP0344	£0.60 £1.00	8948, HRD140, HRD150, HRD455, HRD565 HRD725, HRD755, HRP50, R73AF	ò,			
FV10-11, FV12-13, FV14 3V42	CLUTCHASSY	PU55822	£13.50	NV7000, 7200, 7800 NV8400, NV8600,	CLUTCH IDLER UNIT	VXP0343 VXP0245	£5.50 £1.20	MITSUBISHI 288P02801, HS300, 301, 302, 310	MOTOR REEL SPOOLING	£33,50		
3V44 3V42, 43, 48, 53, 56	CLUTCH ASSY T-UP CLUTCH	PU57658 PU56043-1-4	£11.50 £2.80	NV8610, NV8620 NV8600, NV8610, NV862		VXP0243	£1.20	288P02806, HS303, 304, 320, 330, 700 288P03401, HS303, 700	MOTOR REEL SPOOLING MOTOR REEL TAKE-UP GEN	£31.50		
3V42, 43, 48, 53, 56	SUPPORT CLUTCH	PU56044-1-5	£2.80	NV8620 NV600	CLUTCH IDLER	VXP0343 VXP0488	£5.50 £3.50	NATIONAL				
FISHER	*			NVG21-25, NVG40-45 ORION	PULLEY UNIT	VXP0767	£5.80	MYN 135V5L, NV332, NV333, NV340, NV366 VEM0212, NV730•NV770	REEL MOTOR MOTOR REEL GEN	£13.50		
FVHP520, FVHP530 FVHP615	FF-REW PULLEY CDMP. IDLER ASSY	HI638531 F11430420400300	£1.00 £3.30	VH200-201 VH555-700, VH844-900.	IDLER	850A200004	£3.50	SANYO		€30.00		
PVHP615 PVHP840	GEAR IDLER ASSY REEL T-UP ASSY	FI1430490400900 FI1430410400900	£5.50 £6.50	VH1000-1500, VH1800, VP200, VH530	IDLER	850A200005	£6.50	4-529V-10800 (RM11), VTC5000, VTC5150 SHARP	REEL MOTOR	£6.30		
FVHP905, 906, 908, FVHP910, 916	GEAR IDLER ASSY	Fi1430490402400	£6.20	VH535-630, VH635-640, VH893-1440, VH2500-		200.20000	20.00	RMOTV 1008GEZZ, VC200, VC381, VC384, VC385, VC386, VC483, VC3300, VC8381,	REEL MOTOR	£13.50		
FVHP975, 990, 999, FVHP5000, 5100	IDLER	FI1430420400700	£5.20	2600, VH2700-4010, VH5010				VC9100, VC9300, VC9500, VC9700 RMOTV 1007GEZZ, VC387, VC483, VC486,	REEL MOTOR	£16.50		
GOLDSTAR				PHILIPS DV464, VR6462, VR6463	IDI FR	52220334	£2.50	VC585 RMOTV 1010GEZZ, VC300, VC402, VC471, VC477, VC481, VC482, VC488, VC496,	REEL MOTOR	£16.00		
	IDLER	435038A	£2.50	VR6660, VR6860 VR6460, VR6520, 6920		40340162	£1.70	VC500, VC571, VC581, VC582, VC583, VC584, VC5F3, VC8481, VC8581				
HITACHI	CE DEWINIED	0000074	04.50	DB532, VR6542, VR6843		700 10 102	£7.50	SONY	0100714140700			
VT11-33, VT63-64, VT14,	FF-REW IDLER PLAY IDLER CLUTCH ASSY	6886971 V-6861482 6879515	£1.50 £3.20 £7.50	VHR110, VHR1300,	IDLER	1430662T14730	25.00	BHF 1100D, SLC7 CASSETTE I	CAPSTAN MOTOR	£25.00		
17, 19, 38, 57, VT86, 88 VT120-220	CLUTCH ASSY	6886824	£7.50	VHR1500 VTC5000, VTC5150 VTC9100, VTC9300	FF-REW IDLER	1430741T20001	23.00	FERGUSON & JVC 3V38, 3V39, 8943, 8944, 8951, 3V35, 3V36				
VT8000-8300, VT8500-8700	FF-REW IDLER	6413663	£2.80	VTC9300 VTCM10-20	FF ROLLER ASSY REEL DRIVE PULLEY	1430551T01400 1430547T00200 1430662T10350	£1.20 £2.20 £5.00	HRD121, HRD225 3V42, 3V43, 3V44, 3V45, 8945, 8947, HRD		£24.00		
VT8000-8300, VT8500-8700	PŁAY IDLER	6414221	£3.60	VHR2100, VHR2300 VTC5000, VTC5150	IDLER PULLEY	6130374899 143-0-662T-01201	£5.00 £5.20	HRD455, HRD725 8948, 8950, FV10B, FV12L, FV13H, FV14T.		£24.00		
VT8000-8300 VT8500-8700	FF- REW PULL E Y	6383531	20.80	VTCM10	PULLEY	143-0-662T-10350	£5.50	HRD230, HRD430, HRD530 3V58, 3V59, 3V64, 3V65, FV11R, HRD170,	HRD180, HRD370	£24.00 £24.00		
VT9300-9500 VT9300-9500	FF-REW IDLER PLAY IDLER	8681471 6861482	£3.30 £3.20	VC651, VC681, VC685	IDLER ASSY	NPLYV0107GEZZ	£6.15	VIDEO LA UNIVERSAL VIDEO LAMPS 12V 60ma (300m		20.30		
VT9300-9500	IDLER IDLER	681505 687043	£3.00 £3.80	VC7300, VC7700 VC381, VC383, VC386	PLAY IDLER KIT IDLER	NPLYV0041+ NDA1V1007 NIDL0005GEZZ	£5.00 £1.50	PANASONIC VIDEO LAMPS	in Wines)	£0.50		
VT11-33, VT63-64	FF-REW IDLER	6886971	£1.50	VC8381, VC9100, VC9300, VC9500,	IDEEN	NIDE0003GEZZ	11.30	Part No. SONY FLYBACK TE Models	AANSFORMERS	Price		
HINARI VXL3, VXL20	REEL IDLER	40000009	£1.50	VC9700 VC300, VC387, VC481,	IDLER	NIDL0006GEZZ	£1.50	1-439-216-00 KV-2002E, 2010E, 2200E, 2 KV-2012ME, 2016ME, 2015 1-439-256-11 KV-2704EC, 2704UB, 2704	ME, 2010ME	£14.00 £40.00		
				VC482, VC483, VC496, VC571, VC585				1-439-286-21 KV-2215UB, 2217UB, 2215 1-439-289-21 KV-2705F, 2705FE, 2705UB	El, 2215FE, 2212EX, 2215ET 2705E, 2706UB, 2720EC	£30.50 £40.00		
VR3905, VR3906	T-UP IDLER	PU51402	£1.45	VC780-781, VC785-787, VC793-VCT72	REEL IDLER	NPLTV0111GEZZ	£7.00	1-439-303-00 KV-2064EC, 20PS1, 2082M KV-2062E(ESP) 1-439-311-00 KV-1440AEC, 1440AS MK2,	E7, 2056EC, 2060SA,	£22.75		
VR3906 VR3913, VR3943	REEL IDLER REEL IDLER	PU55374 PU48967	£2.85 £3.00	SAISH0 VR1100, VR1200,	CLUTCH	850A20000	£6.50	KTX-1350NF, KTX-1430UB 1-439-332-21 KV-2756, 2730EC, 2730FE,	2764EC, 2752UB, 2752F	£22.00 £30.00		
JVC				VR1200HQ, VR1600, VR2500, VR3300,				KV-1882ME3, 1882HK, 1882	, 1882CH, 1882AEB, 1882AM AS, 16TR1, 882EC(PS), 1770R 2, 1602M7, 1602GE, AOM-16	£21.50		
HR330, 3660, 4100 HR7200, HR7600,	T-UP IDLER SML T-UP CLUTCH	PU49280 PU53462A	£6.00 £3.00	VR3500, VR3600				KV-2092UB, 2096UB		£22.00		
HR7650, HR7655 HR7200, HR7600	REEL IDLER	PU48967	£3.00		IDLER WHEEL	65224704220	£1.50	NATIONAL LINE OUTPO	JT TRANSFORMER	£19.00		
HR7650, HR7655, HR7700	ROLLER ASSY	PU49042A	€4.00	626	IDLER COMPLETE	69000250330	£4.50	TLF 15542F TLF 14568F		£25.00 £26.00		
HR3300, 3660, 4100 HR7200, 7600, 7650	T-UP IDLER LRG T-UP IDLER	PU47752 PU51402A	£4.50 £1.45	VT611-616, VT620,621, 626				TLF 14567F TLF 14715F TLF 14749B		£26.00 £27.00 £20.00		
HR7655, HRD110, HRD120-121, HRD225	TUDOLUTOU	DI ICEOZO	po or	SONY C6	IDLER KIT ASSY	A 6706391	£3.50	NATIONAL TRAP	ISFORMERS	2.00		
HRD225	T-UP CLUTCH	PU55373	£2.25	C7	IDLER ASSY	X 36533100 A-6706-348-B	£3.80 £4.00	TLF 6609B	OT OTHERD	£23.00		
HRD225	IDLER ARM	PU55374-3-8	£2.85	SL-C6		A-6706-391-A-B	£3.00	HITACHI TRAN	SFORMERS	€20.00		
MATSUI			_	6V MOTOR 9V MOTOR	MODELLE DO INO	OI.	£2.00 £2.00					
VX730, 735, 750, 755, VX810, 820, 880, 990	CLUTCH	850A00005	£6.50	12V CW MOTOR 12V CCW MOTOR 13.2V CW MOTOR			£2.00 £2.00	GRANDA K.P. HOUSI	ATALTO			
	_			13.2V CCW MOTOR	ASSETTE TAPE HE	Ans	£2.90 £2.90	POP IN COMME	RCIAL CENTRE	,		
MITSUBISHI HS306, 307, 318, 319,	GEAR ASSY	Reference 522P00201	€6.25	MOND HEAD STEREO HEAD	TOOLITE INFE	2100	£0.90 £1.50	SOUTHWAY MIDDLESEX	ENGLAND	00		
HS410, 710				MINI HEAO AUTO REVERSE HEAO			Ω2.30 Ω2.60	Tel: 081-900 2329	Fax: U81-903 61	26		

TELEVISION MARCH 1992

	The second secon		
TRIPLERS	\(\frac{1}{2}\).		
UNIVERSAL £4.50	41256-10 150p	8256 700p	75454 65p
THORN 9000 SERIES £8.00	41464-12 240p	8257 220p	75492 55p
PHILIPS G9 £7.50	41464-10 250p 6116 110p	8271 3400p 8279 270p	8T26 95p
G8 520/550 £7.50	6116 110p 6264-15 160p	8283 400p	8T28 110p
KT3 £4.50	6264-12 200p	8284 440p	
DECCA 100 SERIES \$7.50 120/130 \$6.50	6264-10 210p	8287 260 p 8288 650 p	SIMMS
177 CVC 20/30 £7.00	62256-12 450p 6502 300p	8288 650p 8748 700p	256K × 9-80 1300p
CVC 825 £8.00	6502 300p 6502A 360p	8755 800p	256K × 9-70 1500p
RANK T20A \$7.00	65C02 930p	,	1MB × 9-80 3800p
UNIVERSAL	6522 280p	Z80ACPU 110p	1MB × 9-70 4000p
To fit: 20AX TUBE £8.00	6551 380p 6800 210p	Z80ABCPU	SIPS
30AX TUBE £8.00	6800 210 p 6802 220p	Z80AP10 170p	
	6803 500p	Z80BP10 200p	256K × 9-80 256K × 9-70 1600p
DIODE SPLIT TRANSFORMER	6808 500p	ZBOACTC 170p	1MB × 9-80 3900p
LEADS TO FIT CHASSIS CODE: CTX TYPE \$2.50	6809 500p 6810 150p	Z80BCTC 250p Z80AS10 350p	1MB × 9-70 4100p
G11 TYPE £2.50 KT4 TYPE £2.50	6810 150p 6818 380p	Z80AS10-1 300p	
K14 ITPE 12.30	6821 130p	Z80AS10-2 300p	OPTO COUPLERS
	6821 130p 6840 290p		4N25 50p
COMPUTER IC's	6821 130p 6840 290p 6845 370p	Z80AS10-2 300p Z80ADART 350p	4N25 4N26 50p
COMPUTER IC'S	6821 130p 6840 290p 6845 370p 6850 110p	Z80AS10-2 300p Z80ADART 350p 74S289 180p	4N25 50p 4N26 50p 4N27 50p
COMPUTER IC'S 2114 2532 2716 150p 310p 150p	6821 130p 6840 290p 6845 370p 6850 110p 6080A 380p 8085A 300p	Z80AS10-2 300p Z80ADART 350p 74S289 180p 74S387 200p	4N25 50p 4N26 50p 4N27 50p 4N28 50p
COMPUTER IC'S 2114 2532 2716 150p 2732 250p	5821 130p 5840 290p 5845 370p 6845 370p 6850 110p 6080A 330p 8085A 300p 80866 5500p	Z80AS10-2 300p Z80ADART 350p 74S289 180p 74S387 200p 75107 65p	4N25 50p 4N26 50p 4N27 50q 4N28 50q 4N29 90p 4N30 90p
COMPUTER IC'S 2114 2532 2716 150p 2732 250p 2732 280p 2732A 280p	6821 130p 6840 290p 6845 370p 6850 110p 6866 380p 8085A 380p 8086 500p 8088 480p	ZB0AS10-2 300p ZB0ADART 350p 745289 180p 745387 200p 75107 65p 75110 75p	4\(\)25 \ 5\(0 \)p \ 4\(\nabla 26\) \ 5\(0 \)p \ 4\(\nabla 26\) \ 5\(0 \)p \ 4\(\nabla 26\) \ 4\(\nabla 26\) \ 9\(0 \)p \ 4\(\nabla 30\) \ 9\(0 \)p \ 4\(\nabla 31\) \ 9\(0 \)p \ 4\(\nabla 31\)p \ 9\(0 \)p \ 4\(\nabla 31\)p \ 9\(0 \)p \ 4\(\nabla 31\)p \ 4\(\nabla 31\)p \ 9\(0 \)p \ 9\(0 \)p \ 4\(\nabla 31\)p \ 9\(0 \)p
COMPUTER IC'S 2114 2532 2716 2732 2732 2800 2732 2732A 2800 2764 1800	5821 130p 5821 130p 5840 290p 5840 5845 370p 5850 110p 5850 300p 5860 300p 5866 500p 5866 500p 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866	ZBOAS 10-2 300p ZBOADART 350p 745289 180p 745387 200p 75107 65p 75110 75p 75113 100p 75122 110p	4N/25 50p 4N/26 50p 4N/27 50a 4N/28 50a 4N/29 90p 4N/30 90p 4N/31 90p 4N/31 100p
COMPUTER IC'S 2114 2532 2716 150p 2732 2739 280p 2732 2734 280p 2764 180p 27164 400p 27128	5821 130p 5821 130p 5840 290p 5846 370p 5850 110p 5850 300p 5850 300p 5850 300p 5866 510p 5866 510p 5866 510p 5866 510p 5866 510p 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866 5866	Z80AS10-2 300p Z80ADART 350p 74S289 180p 74S387 200p 75107 65p 75110 75p 75113 100p 75122 110p 75150 95p	4N/25 50p 4N/26 50p 4N/27 50a 4N/28 50p 4N/29 90p 4N/30 90p 4N/31 90p 4N/31 100p 4N/32 1100p 4N/33 100p
COMPUTER IC'S 2114 2532 310p 2716 150p 2732 250p 2732 250p 2732A 280p 2764 180p 27128 190p 27128 190p 27128 3100p	6821 130p 6840 290p 6845 370p 6850 110p 6080A 380p 8085A 300p 8086 500p 8088 480p 8156 300p 81LS96 130p 81LS97 130p 81LS98 130p 31S99 130p	ZBOASIO-2 300p ZBOADART 350p 745289 180p 745287 200p 75107 65p 75110 75p 75113 100p 75122 110p 75150 95p 75154 100p	4N/25 50p 4N/26 50p 4N/27 50q 4N/27 50q 4N/29 90p 4N/30 90q 4N/31 90p 4N/32 100p 4N/33 100p 4N/36 58p 4N/37 58p
COMPUTER IC'S 2114 2532 2716 2716 150p 27732 2732 2732A 280p 27764 180p 277128 191p 27726-25 300p 27512	5821 130p 5821 130p 5840 290p 5845 370p 5845 370p 5850 110p 5850 380p 5850 380p 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850	ZBOASTIO-2 300p ZBOADART 350p ZBOADART 350p 74S289 180p 74S387 200p 75107 65p 75113 100p 75122 110p 75150 95p 75154 100p 75162 700p	4N/25 50p 4N/26 50p 4N/27 50a 4N/28 50p 4N/29 90p 4N/30 90p 4N/31 90p 4N/31 100p 4N/32 1100p 4N/33 100p
COMPUTER IC'S 2114 2532 310p 2716 150p 2732 250p 2732A 280p 2764 180p 27024 400p 27128 190p 27256 27512 500p 27512 500p	6821 130p 6840 290p 6845 370p 6850 110p 8080A 380p 8085A 300p 8086 500p 8088 480p 8155 330p 811596 130p 81LS97 130p 81LS98 130p 8224 240p 8226 240p 8243 250o	ZBOASTIO-2 300p ZBOADART 350p ZBOADART 350p 74S289 180p 74S387 200p 75107 65p 75113 100p 75122 110p 75150 95p 75154 100p 75162 700p 75182 95p 75183 95p	4N/25 50p 4N/26 50p 4N/27 50a 4N/28 50p 4N/29 90p 4N/30 90p 4N/31 90p 4N/32 110p 4N/32 100p 4N/33 56p 4N/36 56p 4N/38 68p
COMPUTER IC'S 2114 2532 310p 2716 150p 2732 250p 2732A 280p 2764 180p 27028 190p 27128 190p 27128 190p 27128 190p 27128 190p 27126 100p 4164-15 110p 4164-15 110p	6821 130p 6840 290p 6845 370p 6850 110p 6080A 380p 8085A 300p 8086 500p 8088 480p 8156 300p 8159 130p 81LS96 130p 81LS97 130p 81LS98 130p 8224 240p 8225 226p 8243 250p 8250 750p	ZB0ASti0-2 300p ZB0ADART 350p 74\$Z89 180p 74\$Z89 74\$Z89 74\$Z89 75107 65p 75110 75p 75113 100p 75122 110p 75150 95p 75154 100p 75162 700p 75182 95p 75183 95p 75183 95p 75188 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950	4N25 4N26 500 4N27 4N28 501 4N29 4N29 900 4N31 900 4N31 900 4N32 1000 4N33 1000 4N36 580 4N38 680
COMPUTER IC'S 2114 2532 2716 150p 2716 150p 2732 2732A 280p 2764 180p 27128 191p 27128 27256-25 300p 4116 50p 4164-15 110p 4164-12 120p 4164-10 130p	5821 130p 5821 130p 5840 290p 5845 370p 5845 370p 5845 370p 5845 380p 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850 5850	ZBOASIO-2 300p ZBOADART 350p 74S289 180p 74S387 200p 75107 65p 75113 100p 75122 110p 75150 95p 75154 100p 75162 700p 75182 95p 75183 95p 75184 55p 75182 95p 75183 95p 75188 55p 75189 55p	4N25 4N26 500 4N27 4N28 500 4N28 500 4N29 4N30 900 4N31 900 4N31 900 4N32 4N33 1000 4N33 1000 4N37 580 680 LED DISPLAY
COMPUTER IC'S 2114 2532 310p 2716 150p 2732 250p 2732A 280p 2764 180p 27028 190p 27128 190p 27128 190p 27128 190p 27128 190p 27126 100p 4164-15 110p 4164-15 110p	6821 130p 6840 290p 6845 370p 6850 110p 6080A 380p 8085A 300p 8086 500p 8088 480p 8156 300p 8159 130p 81LS96 130p 81LS97 130p 81LS98 130p 8224 240p 8225 226p 8243 250p 8250 750p	ZB0ASti0-2 300p ZB0ADART 350p 74\$Z89 180p 74\$Z89 74\$Z89 74\$Z89 75107 65p 75110 75p 75113 100p 75122 110p 75150 95p 75154 100p 75162 700p 75182 95p 75183 95p 75183 95p 75188 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950 950	4N25 4N26 500 4N27 4N28 501 4N29 4N29 900 4N31 900 4N31 900 4N32 1000 4N33 1000 4N36 580 4N38 680

VIDEO HEAD TESTER



- 1. Mechanical Position of Pointer
- 2. Scale Plate
- 3. Pointer Adjusting Screw
- 4. Pointer
- 5. Measuring Socket
- 6. Power ON/OFF and Battery Check Switch
- 7. Range Selector Rotary Switch
- 8. CAL. ADJ (calibration volume)
- 9. Measuring Clip

* * * * * STOP PRESS * * * * *

PHILIPS PRESSURE ROLLER ASSEMBLY

for the following models:

DV186, 190, 286, 562, 761, VR6180, VR6185, VR6285, VR6382, VR6367, VR6467, VR6468, VR6870, VR6182. 6290, 6291, 6293, VR6393, VR6468, VR6670, 6760, 6761, VR6970

SOLDERING IRONS

Wooden Handle

30 Watt 220/100 Volts Soldering Iron	3.	50
40 Watt 220/100 Volts Soldering Iron	3.	50
60 Watt 220/100 Volts Soldering Iron	3.	50

PRICE

YF-225 VHS £30.00 + VAT YF-225B BETAMAX £29.00 + VAT

GRANDATA LTD

K.P. HOUSE, UNIT 15, POP IN COMMERCIAL CENTRE, SOUTHWAY, WEMBLEY, MIDDLESEX, ENGLAND

Telephone: 081-900 2329 Telex No: 932 885 (Sunmit) Fax: 081-903 6126

Access & Visa Card accepted. Open Monday to Saturday.

PLEASE PHONE US FOR TYPE NOT LISTED HERE AS WE ARE HOLDING 5000 ITEMS AND QUOTATIONS ARE GIVEN FOR LARGE QUANTITIES.

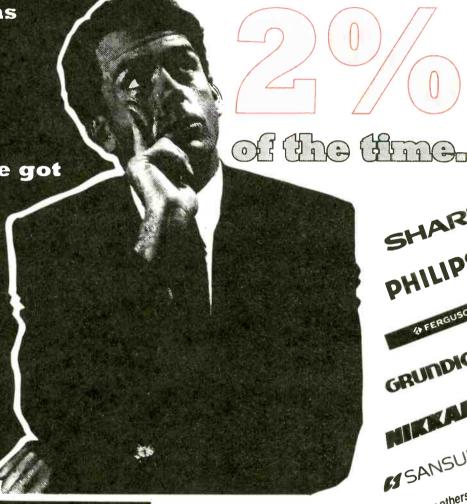
Please send £1 P&P and VAT at 17½%. Govt, Colleges, etc. Orders accepted. Quotations given for large quantities. Please allow 7 days for delivery. All brand-new Components. All valves are new and boxed. Prices quoted are subject to stock availability and may be changed without notice.



This means that no matter what spare you need we've got H

you the customer the widest range of spares, service aids and equipment to enable you to keep abreast with today's demanding technology. No order is to small phone us now and order your spares. And remember you don't have to use part numbers, so its even easier to get what you need.

Our aim is to offer



SHARP PHILIPS & FERGUSON GRUNDIG MIKKAI

\$ SANSUI and many others



Head Office: 11, Arkwright Road, Reading, Berks. RG2 0LU Tel: 0734-876444 Fax: 0734-867188 COPS No: 0734-311969

Enterprise Park, Reliance Street, Manchester, M100AL Tel: 061-682-1415 Fax: 061-682-9031 COPS No: 061-683-4411

11, Marhill Road, Carlton, Nottingham. NG4 3AJ Tel: 0602-870789 Fax: 0602-878772

E.E.C. SATELLITE SERVICES "THE MAC SPECIALISTS" ARE PROUD TO PRESENT!!

SENSIBLE SYSTEMS FOR SENSIBLE PEOPLE AT SENSIBLE PRICES

Including

+ Pace 9200 + Cambridge 480 + Extra + Philips 801 +

+ Johansson 5000s + Chaperell Monteray 20 & 40 + ITT Nokia SAT2200 + Philips 901 + Amstrad 600

NEW:

The amazing Nokia sat 200 built in D2MAC decoder with built in EUROCRYPT decoder + SVHS output and much more Please phone for specifications

STAND ALONE MAC DECODERS

THE NEW AMSTRAD 600 D2MAC SYSTEM



PHILIPS STU901 MAC SYSTEM



MAIL-ORDER SPECIALISTS
WITH FULL BACK UP SERVICE



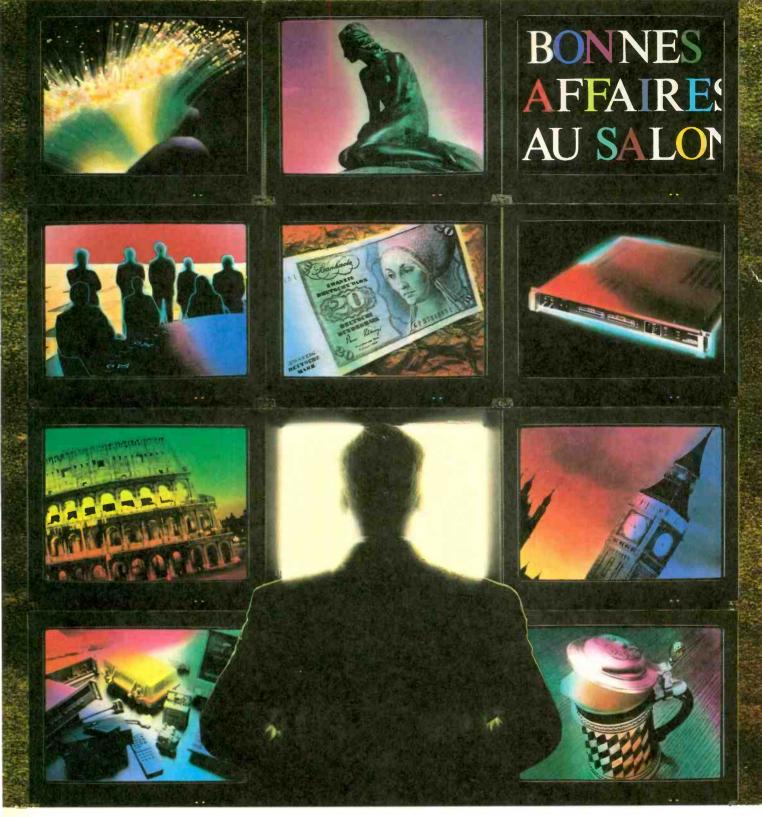


CALL THE EXPERTS NOW
CALL



E.E.C. SATELLITE SERVICES
1426 LONDON Rd, LEIGH-ON-SEA, ESSEX SS9 2UL

TELE: 0702 480169 TELE: 0702 471321 "ALL YOU NEED TO KNOW IS US"



TUNE IN TO THE WHOLE OF EUROPE

No trade barriers. No red tape. Now your company can really compete. And there's no better place to plan your European marketing strategy than at Cable & Satellite 1992.

It's your chance to view the very latest technology and attend a program of topical industry seminars where leading experts will discuss the issues that affect your company's future.

Cable & Satellite 92 at Olympia London 13-15 April, is the place in Europe to see and hear about all the latest systems and most recent developments in products and technology. Retailing, engineering, investment, installing, programme making and advertising.

Whatever your interest, Cable & Satellite 1992 puts you in the picture.

A hotel reservation service has been arranged for your convenience. Please tick the box below to receive details.

To order tickets call 0203 464004 or return the coupon to: Cable & Satellite 92, Coventry Data Services, Data House, Curriers Close, Tile Hill, Coventry CV4 8AW. Tel: 0203 464004.

Fax: 0203 694471.

Scitellite
Olympia London
13-15 April 1992
The European Broadcasting & Communications Show

Cable & Satellite 92 is organised by Reed Exhibition Companies. No under 18's admitted.

Please send metickets to the Cable Please send me details of hotel packages [] (& Satellite 92 Exhibition. Please send me full details and a registration application to the Cable of please tick).	& Satellite 92 Seminar (please tick).
Name (Mr/Mrs/Miss)	Job Title	
Company	Company Address	
	Postcode Tel. No.	Fax No

WE WILL ONLY SUPPLY TOP QUALITY, BRANDED COMPONENTS.

G.G.L.COMPONENTS

BUY WITH

AERIAL ACCESSORIES	INTEGRATED	TYPE	PRICE (£)	LINE O/	P TRANS	REMOTE CO!		TRANSISTOR		VIDEO HEAI
Coax L/connector	CIRCUITS	TDA1516	7.75	Decca 100 Ferguson TX8	9.95 3521.75			TYPE BC307	PRICE 10	Alba 4000X
Connector 20	TYPE PRICE (£	10/11310	5.50		00 (14") 19.7 5	Ferguson T742	14.95	BC327	10	Amstrad 4500/9000
ly Lead 2m	CNX62A 4.75 CNX83A 3.95		A 4.50 A 3.70	Ferguson TX9	0 (20")21.50	Ferguson T785		BC337	10	Amstrad 4600/4700
Splitter95	HA1377		A	Ferguson TX9			12.50	BC547/8 BC557/8	10	Amstrad 6000
Way Distribution mplifier Mains 21.75	HA130014.50	TDA2004	2.95		00 90D 19.95 00 110D 19.95	" TYGOT		BC639		Amstrad 7000
mplifier Mains21.75	HM6251 5.95		2.95	Ferguson TX		Ferguson TX10 Ster	eo 12.95	BC640	20	Ferguson 3V00/39
CAPACITORS	HM6232 5.95 LA4445 2.45	, , , , ,		110D FST	23.50	Ferguson 3V23	14.95	BD238	40	Ferguson 3V32 Ferguson 3V42/55
0091uf/1500v1.25	LA4460 2.45			Fidelity ZX200	OO +	Ferguson 3V32 Ferguson 3V35	14.50 14.50	BD677	65	Ferguson 3V43
1f 5.5v (back-up)	LA4461 2.45	TDA2530		Mod)	12.50	Forgueon 3V45		BF337	30	Ferguson 3V65/FV11
If at 250v	LA78002.95				0	i cigusun avaa		BF422 BF423		Fisher 615/910
f at 400v25	LA78012.95			Hinari CT4/5	19.95	r crguson 5455		BF458		Hitachi 8000/9700
7uf at 250v25 7uf at 400v35	M293B1 7.95		A 3.25 3.75	Hinari CT6/7	19.95	Fidelity CTV14S		BF460	95	Hitachi VT11/33
7uf at 400v	M491BB1 14.75 M5840II/84RS 12.95		A	Hitachi CPT14				BF757	70	Hitachi VT17/19
uf at 400v75	MC13002P 4.95	TDA2578/	A		80 19.95			BF871		Hitachi VT63/64 Hitachi VT65
uf at 250v	SAA1293-026.95	TDA2579	3.75	ITT CVC25/30/ ITT CVC800/1/		Ordinaly IT 400 Text		BR103		Hitachi VT120E
uf at 250v	SAA5000A4.95	TDA2581	2.95	→ITT CVC830		drandig 11 030		BT151/800		Hitachi VT130E
Ouf at 250v	SAA50124.95	TO	2.50 32.95	ITT CVC1100.		Hitachi CP [2038	15.95	BU126		JVC HRD250
(All the above are pcb mounting)	SL1430	TDAGEGA	2.95		21.50			BU208A BU208D	1.43	Matsui VX730
are peo mounting;	SL1432 1.95	TDASSOO		ITT CVC1200/1		Hitachi CPT2508		BU326A		Matsui VX735A
DIODES	STK5325	TDA2653	AQ3.95	ITT CVC1204		Hitachi CPT2888	15.95	BU426A	1.45	Mitsubishi HS301/302
PE PRICE	STK5332 6.95	IDASSSU	3.95		t 110D22.50	milacili v 163/64		BU500		Mitsubishi HS303/305
M95	STK533312.50	TDA3300	4.95 4.95	ITT Monoprin	t B22.50	THEOCHI VI 120C		BU508A BU508AF	1.50 1.95	NEC 9034/9053
7133	STK53356.95	TDA3561A		Matsui C1410	/142026.95			BU508D	1.95	Panasonic NV230
229/80095	STK5421 7.95 STK5422 6.95	TDAGECO	A (TFK)		A26.95		12.95	BU508DF	2.50	Panasonic NV333
299/80035	STK5422 6.95 STK5471 8.75	TDA3565	4.95	Philips CF1	23.50 22.95	ITT VS4	14.95	BU508V		Panasonic NV366 Panasonic NV370
4007 10 5408 20	STK54818.95	TDA35716	BQ7.95	Philips CTX 14		DET VICE Tour	14.95	BU705 BU807	2.95 1.75	Panasonic NV430
X61C (1.3 Watt)	STK5482 8.95	TDA35768	7.50		23.75	Panasonic EUR5120		BU826A	2.95	Panasonic NV688
5, 6v8, 7v5, 9v1, 12v, v, 24 v, 33v, 68v, 120v,	STK7308 7.95 STK7348 7.95		2.75 AQ 4.75	Philips K35	22.95	Panasonic TNQ141		BU907	2.95	Panasonic NV730
7, 24v, 33v, 68v, 120v, 0v (5 per Value)1.00	STR441 6.75		Genuine 9.95		23.75			BU908	2.95	Panasonic NV777 Panasonic NV788
	STR4090 8.95	TDA3653	3.95	Philips 2A Saisho CT141)	23.50 X26.95	Panasonic NV730		BUT11AF	2.75	Panasonic NV2000/70
E.H.T. TRAYS	STR4211 4.50	TDA3653	4.95	Sharp C1410	A			BUT12A BUT56A	2.95	Panasonic NVG7/9
ntinental 30AX Focus8.95	STR54124.95		A3.95	Onarp C1410	24.55	Philips G11 I/R Text	12.95	BUX84		Panasonic NVG10/12.
CCA 120/130	STR40090 8.95		3.95 H 5.95	ON/OFF	SWITCHES	Philips KT3/30 N/Te	ct12.95	R4050	80	Panasonic NVG18 Panasonic NVG20/21.
UNDIG CUC2410	STR50020		4.50		ard1.00	Philips KT3/30 Text.		T9053V	3.50	Panasonic NVG30/40.
7/26"19.95	STR54041 9.95		6.95	TX9/10 Remot	e1.75	Philips KT4/CTX Tex Philips RC5991	12.95	T9054V		Philips 6460/6520
F CVC20/30 6.95 HLIPS KT3 7.95	STR550416.95	TDA4600/	2 2.95		dard 1.50	Philips VR6362/7		19064V	1.95	Philips 6462/6560
3M T20/22A	STR58041 6.95			Fidelity CTV/14	note 1.75 10 1.50		33.75	TIP29E (TD168V)		Genuine
10RN 9000 8.00 VIVERSAL 5.95	STR6020 (KIT) 5.95 TA7227P 2.95			Fidelity CTV14	R 2.95			TIP41C	50	Philips 6467 Philips 6760 Genuine
VIVERSAL5.95			(Genuine)8.50	Fidelity CTV14	\$2.95	Rediffusion MKIVA		TIP42C TIP112H (TO167V)		
FUSES	TBA120U 1.95 TBA820M 1.75	TO ACCOO		Grundig CUC7	313.50	8 81 400 1 1000		TIPL791A		Samsung VX520/710
mm A/S; (Pkts of 10)	TDA1035T 2.95		3.95	Philips G11 St	andard 1.35 mote 1.75	Sony RM615/632	14.95	2SC1942	2.95	Sanyo VHR1100/1300 . Sanyo VHR2300/3200 .
OMA, 315MA, 500MA,	TDA10372.75	TEA1039	2.95	Philips KT3 Re	emote 1.75	200A KWP/0		2SC3156	2.95	Sharp VC9300/381/481
0MA, 800MA, 1A, 1.6A, 1, 2.5A, 3.15A 4A, 5A,	TDA10442.95	TF 4 2018 4	2.95	Philips KT4/CT	X Remote 1.75	Tatung RC31	22.95	2SD725 2SD1398	4.95 2.50	Sharp VC581/681
A, 8A	TDA1170S 1.95 TDA1510 3.80	UPC13650	3.95	Sony Hoiyars	3 Volume 3.95	Tatung RC40/45 Tatung RC42	14.95	2SD1453		Sony C5/6/7
mm 0/B; (Pkts of 10) 0MA, 630MA, 800MA, 1A,	TDA1512 3.50	UPC1378F	3.95	Sony KV1612	Remote3.95	Tatung RC60	14.95	7805		Toshiba V73/83B
6A, 2A, 2.5A, 3.15A60	TDA15154.50	UPC13940		Sony KV2022 F	Remote3.95	Tatung RC70	17.95	7812	50	Toshiba V93B
			CA8.50							
BA VIDEO SPARES	FERGUSON		HITACI			IASONIC		VIDEO REPAIRS		ammable Remote Cont
4000 Kit1.	VIDEO SPAR 95 3V44/45		VIDEO SPA	ARES		SPARES	VTC5000 Belt Kit	1.00	Only .	
acitor Back-up			VT63/64E Belt Kit	1.95	NV777 Renair Kit (Gen	uine)12.95	Reel Motor	(Genuine)7.95		B community in
:h Roller3.	95 Belt Kit	1.50	Canstan Motor	27 50	Belt Kit	1.95	Reel Pulley	(Genuine)5.95		© SCIANA © SCIANA
I Idler 3. Pulley 1.	5 Clutch Assembly	25.95	Clutch Assembly FF/REW Idler	7.95	Pincti Holler	3.95	Video Head	27,50		Sarran pe
o Head 21.	0 Pinch Roller		FF/REW Idler Pinch Roller	2.50 3.95	Reel Idler (Gen Video Head	uine)	CHADE	VIDEO SPARES		
5000	Remote Control	15.95	Repair Kit	17.95	NV2000/2010	20.33	VC9300/381	VIDEO SPANES		THE COURT HOLD
Kit 1.5		19.50	Video Head VT63/64E.	22.50	Repair Kit (Gen	uine)21.50	Belt Kit	2.50		
h Roller 3.			Video Head VT65E	34.95	Belt Kit Pinch Roller	1.95	Pinch Rolle	r	1	
Pulley1.	95 Belt Kit	1.75	VT120/130E Belt Kit	1.95	Play Idler (Gen	3.95 uine) 1.25		Genuine) 3.95 (Genuine) 12.95		\$ EEEE \$
o Head21.	Capstan Motor	27.50	Ciutch Assembly	7.95	Reel Idler (Gen	uine)1.25	Video Head	17.50		1135
AMCTRAR	Cassette Housing Pinch Roller	29.95	FF/REW Idler	3.75		9.50	VC481/482			
AMSTRAD VIDEO SPARES	Reel Idler	2.75	Pinch Roller Repair Kit	3.95	NV7000/7200 Poppir Kit / Goo	uine)17.50	Belt Kit Pinch Rolle			
VIDEO SPARES 4500/4600	Reel Motor	15.95	Video Head VT120E	24.95	Repair Kit (Gen Belt Kit	uine)	Reel Idler (Genuine)3.95	1	CATY UNIVERSAL CONTROLLER IR 150R
Kit VCR4500 1.5		23.50	Video Head VT130E	29.95	Pinch Roller	3.95	Reel Motor	(Genuine)14.95		UNIVERSAL CONTROLLER
Kit VCR4600 1.9		PARES			Play Clutch (Ge Reel Idler (Gen	nuine) 4.95 uine) 1.25	V:deo Head VC581/582			
o Head VCR450018.		ANES	PANASONIC		Video Head	9.50	Belt Kit	2.50		* * SPECIALS *
o Head VCR4600	75 Belt Kit	1.95	SPARE		NVG7/10/12		Pinch Rolle	r3.95	AA B	atteries (Pkt 4)
	Clutch Assembly Pinch Roller		NV230/430		Repair Kit (Gen	uine)12.95	Reel Idler (Genuine) 3.95 (Genuine) 18.95		Batteries (Pkt 4) n Kit
FERGUSON	Reel Idler	5.95	Repair Kit (Genuine) Belt Kit	1.95	Belt Kit Mode Switch	1.95 3.95	Video Head	17.50	CTX 8	HT Lead (Genuine)
VIDEO SPARES	Video Head	17.50	Mode Switch	3.95	Pinch Roller	3.95	VC681			lder Braidlder Pump
Kit 2.			Pinch Roller Reel Idler (Genuine)	3.95	Reel Idler (Gen		Belt Kit Pinch Rolle	2.50 r 3.95	Mats	ui Lever Assy
h Roller 3.5	LIUICH ASSEMBIV	19.95	Tension Band	2.95	Video Head (N) Video Head (N)		Reel Pulley	(Genuine) 7.95	Philip	s Battery 1V2
e-Up Clutch (Large) 5.9 e-Up Clutch (Small) 5.9	Reel Idler	5.95	Video Head NV230	22.50			video Head	17.50	Philip	s Battery 2V4sol Gas Iron
o Head 9.			NV333/366			HILIPS	VCA140/VC Belt Kit	T72 2.95	Porta	sol Tips
9/30			Repair Kit (Genuine)			SPARES	Pinch Rolle	r3.95	solde	r 0.5Kg, 18 SWG
air Kit12.			Belt Kit Pinch Roller	1.95	VR6460/6520		Reel Pulley	(Genuine)7.95	Sprin	g Kit
Kit 1.1 stan Motor 32.1	0 V/Tenno/ezonE	LJ	Play Idler (Genuine)	4.95	Repair Kit		Video Head	17.50	U341	Tuners
sette Lamp	80 Relt Kit	1 05	Reed Idler (Genuine)	1.25	Belt Kit	1.95	SONY	VIDEO SPARES	VHS (Clear Test Tape
ding Belts (5)	5 FF/REW Idler	2.95	Reel Motor Tension Band	17.95 2.45	Pinch Roller Reel Idler	3.95 2.95	C5/6/7	VIDEO SPANES	VHS-	C Adaptor Battery
h Roller 3.9	_ II TIL TY FUNCY	205	Video Head NV333	9.50	Video Head		Belt Kit C5/		98003	Positor
e-Up Clutch 2.5			Video Head NV366	24.95	VR6462/6560		Belt Kit C6.	1.95		Positor
e-Up Idler 1.8	35 VT0300/0300E		NV370		Repair Kit	14.50	Pinch Rolle Rewind Kit	r	98012	Positor
	35 VT9300/9700E	4.05		12.95			Rewind Kit Rewind Kit	C5/7 4.95 C6 3.95	98012 Video	

FF REW Pulley	95	Tension band		neer ruler		D-t-K'- Cr.O
Play Idler	3.95	Video Head NV333		Video Head	12.50	Belt Kit C5/7 Belt Kit C6
Play IdlerVideo Head	17.50	Video Head NV366	24.95	VR6462/6560		Pinch Roller
VT9300/9700E		NV370		Repair Kit	14.50	Rewind Kit C5/7
Belt Kit	1.95	Repair Kit (Genuine)	12.95	Cassette Housing Pinch Roller	17.50	Rewind Kit C6.
Capstan Motor		Belt Kit	1.95	Pinch Roller	4.50	Video Head 1
FF/REW Idler	2.75	Mode Switch		Reel Idler (Genuine)		***************************************
FF/REW Pulley		Pinch Roller	3.95	Video Head (Genuine)	42.95	MEDEO DELT MITO
Play Idler	3.95	Reel (Genuine)		VR6467		VIDEO BELT KITS
Play IdlerRemote Control	15.95	Tension Band	2.45	Repair Kit (Genuine)	21.50	Akai VS1/3/5
Video Head	17.50	Video Head	12.50	Beit Kit	1.95	Mitsubishi HS302
VT11/33E		NV730		Cassette Housing	19.95	Sanyo 1100
Repair Kit	17.95		12.95	Pinch Roller Arm Assy		Sharp 8300.
Beit Kit	1.95	Repair Kit (Genuine) Belt Kit	1.95	Reel Idler Assy	11.95	Snarp 8300.
Capstan Motor VT11E		Mode Switch	3.95	Video Head (Genuine)	37.95	
Capstan Motor VT33E		Pinch Roller		VR6760		VIDEO LAMPS
Clutch Assembly			3.95	Repair Kit (Genuine)	21.50	Ferguson 3V00/22
FF/REW Idler				Belt Kit	1.95	Ferguson 3V29
Pinch Roller	3.95	Remote Control	15.75	Cassette Housing	19.95	Panasonic NV2000
Tension Band	2.95	Tension Band	2.45	Pinch Roller Assy	12.95	Sharp 9300
Video Head						Universal

S1/3/5.... ishi HS302... 1100..... 7300.... VIDEO LAMPS Ferguson 3V00/22 Ferguson 3V29 Panasonic NV2000 Sharp 9300 Universal

8mm Battery
98003 Positor
98012 Positor
98012 Positor
98012 Positor
Video Leads
Camcorder Copying Kit.
Scart Lead Fully Wired.
Scart Led to 6 Phono.
Scart Copying Kit.
Scart to 5 Scart SKT.
Video Copying Kits .2.50 .1.95 .4.50 .4.95 .3.95 .14.95 1.25 1.25 1.25 1.45 .7.95 4.95 4.95 5.95 6.95 4.95

ORDERING
Please add £1.00 for PIP U.K.
Add 17.5% VAT to this total.
Service Manuals £1.25 PiP each.
Export Orders PIP
charged at cost
Delivery By Return On Stock items.
Minimum Order £5.00

Video Head
3V35/39
Repair Kit.
Belt Kit.
Capstan Motor
Cassette Housing
Cassette Housing
Cassette Housing
Flinch Roller
Reel Idder
Remote Control
Take-Up Idler
Take-Up Clutch
Tension Band
Video Head

EURAS System

The largest Database of CD, TV and Video Repair Tips information in Europe Available On-Line or in Books and now...

NEW STAND-ALONE PC VERSION AIWA

- Purchase the whole system or just one manufacturer
- It's fast and easy to use
- There are no hidden costs
- Updates available
- Suitable for any IBM compatible PC
- You can even enter all your own repair tips

"No more bits of paper"

STILL AVAILABLE:

The Books or The On-Line System

- 73,000 Repair Tips
- 5,300 Models
 - 180 Manufacturers

Tel: 0272 724475 Fax: 0272 723374

Euras International Limited Heston House, 7/9 Emery Rd, Brislington, Bristol BS4 5PF, England

AKAI ALBA **AMSTRAD ARISTON** ARISTONA B & O **BAUER BOSCH** BRANDT BLAUPUNKT BUSH CANON CHINON **DECCA** DUAL **FERGUSON FIDELITY FISHER FUNA GFC GRAFTZ GRUNDIG** HANSFATIC HITACHI INTERFLINK ITT JVC **KENDO** KENWOOD LOEWE MARANTZ MATSUI METZ MITSUBISHI NEC **NECKERMAN** NOVA **NORDMENDE** ORION PANASONIC **PHILIPS PIONEER** PYE

QUELLA

QUELLE

SAMSUNG

SANYO

SCHNEIDER SHARP SIEMENS

> SONY TATUNG

TELEFUNKEN

THORN TENSAL

TOSHIBA

TELERENT

UHER UNIVERSUM

GENUINE



SPARES

FULL RANGE AVAILABLE from



Phone now to open a Trade Account and receive your free copy of the most comprehensive spares catalogue in the industry.

Over 1,100 pages packed with top quality spares at competitive prices.

180-200 North Road Preston, PR1 1YP.

TEL: 0772 555034

FAX: 0772 201905



104 ABBEY STREET ACCRINGTON, LANCS BB51EE 雷 0254 236521/232611

FAX 0254 395361 24 Hr Answering Service

SEND LARGE S.A.E. FÜR TRADE CATALOGUE

COMPLETE SECURITY

e a complete range of security products and ns Individually or can tailor make a package own requirements. E.G. this package is basic cost and would fit a 3 bed. house.

COST £125.00 PACK INCLUDES

(Typical 3 bed house)
Two zone keyswitched panel Logic 4 ★ Polyprop. * Two Zolie Reyswitched parties Logic 4 * Polyprop. bell box/back plate/sticker * Battery/tamper switch * External sounder * Two passive infra red detectors * Five pairs window/door contacts * 100m 4 core cable and clips * Internal sounder * Buzzer for edit/entry timer * Panic button.

TELL US YOUR NEEDS — WE DELIVER FAST

NEW VIDEO PLUS + NEW FOR RECORDING YOUR FAVOURITE PRO-GRAMMES — LOOKS LIKE A REMOTE

THIS PRODUCT MAKES VIDEO PROGRAMMING SO SIMPLE EVEN A GROWN UP CAN DO IT!! SU SIMPLE EVEN A GROWN UP CAN DO IT!!
IT'S SO EASY TO USE — FROM 6 DEC,
NATIONAL WEEKLY AND DAILY PAPERS INC.
TV TIMES WILL PUBLISH VIDEO PLUS CODE
NUMBERS NEXT TO THE PROGRAMME
LISTINGS FOR TV AND SATELLITE. JUST TAP
IN THE CODE LISTED NEXT TO THE PRO-GRAMME YOU WANT TO RECORD AND ITS
DONE!! VIDEO PLUS WILL RECORD PROGRAMMES FROM ANY TV OR SATELLITE
CHANNEL ON NEARLY ALL INFRA-RED CONTROLLED VIDEOS

£45.00 + VAT

SPECIAL OFFER

WHILE STOCKS LAST Amstrad SRD 400 Satellite System

60cm Black Mesh Disc, Receiver and LNB £157 + VAT

NEW VALVES

2000 types available and now an exciting NEW RANGE of alist HI-FI, PRE-AMP, and POWER VALVES. Over 2000 types av

DEGAUSING COILS

External Stick Type Demagnetising

VIDEO RABBIT

SEND VIDEO/AUDIO SIGNAL TO ANY OF THE TV SETS IN YOUR HOUSE. LIKE HAVING A VIDEO IN EVERY ROOM, TRANSMITTER AND WIRES O THIN IT CAN HARDLY BE SEEN. AS OWORKS FOR SATELLITE. \$47.00

ONE FOR ALL II REMOTES

IDEAL FOR REPLACING LOST OR DAMAGED REMOTES. WILL WORK FOR MOST INFRA-RED EQUIPMENT £35.00

PERISWITCH £63.00

LOOK AT LAST!! A Scart connecting system without loss of quality. Compatible with all TVs, satellites & VCRs which have Scart connectors. Has 3 Scart sockets and is fully automatic! Without manual or remote switching, totally reliable. Delivers stereo audio from stereo VCRs and satellite receivers to twin audio channel TVs. Delivers RGB signals. Retains function switching and maintains recording/viewing playback options.

FILMNET DECODERS ALFASAT 1 DECODER WITH RTL/V 95.00 + VAT

PLEASE RING FOR AVAILABILITY ON DIGITAL SOUND MODULE FOR FILMNET DECODERS.

RILV IS A GENERAL ENTERTAINMENT CHANNEL (WITH SOUND) MAINLY ENGLISH WITH DUTCH SUB-TITLES.

SATELLITE SYSTEMS

We can supply DISMES, RECEIVERS, LINB, FIXING BRACKETS, F CONNECTORS, CABLE, SAT FINDER METERS, CRIMPING TOOLS, TAPE, LEADS, MASTS ETC. FULL RANGE AVAILABLE AS LISTED IN CATALOGUE. PLEASE SEND LARGE SAE.

NEW PRODUCT

EXCITING NEW SATELLITE ACCESSORIES

DUAL OUTPUT LINB AND MULTISWITCH IT LAST THE DUAL OUTPUT LNB IS VAILABLE. YOU CAN NOW WATCH IFFERENT PROGRAMMES ON RE-EUVERS ALL OVER THE HOUSE; EACH ECEIVER WILL THINK THAT IT HAS ITS OWN DISH.

DUAL OUTPUT LNB

FOUR-WAY MULTISWITCH

FOUR-WAY MULTISWITCH

1.2db LNB — THIS BRAND NEW LNB
HAS BEEN DESIGNED AS A DIRECT
REPLACEMENT FOR THE BLUE CAP LNB
£45.00

ALSO AVAILABLE: 60cm AMSTRAD BLACK MESH DISH WITH LNB (i.e. NO RECEIVER) £70.00

SUPER BUY SATELLITE CABLE.

£27.50

EXCELLENT QUALITY 100m £17.50 + VAT

NEW PRODUCTS

A/C D/C DIGITAL METER £25.00 AMPL SET TOP TV/FM AERIAL VHS ALIGNMENT TEST TAPE £69.00 HITACHI VT64 CAPSTAN MOTOR £23 00 MATSUI/ORION LOPT 1410/1420 £17.85 **ULTIMATE SCART**

CASSETTE HOUSING ASSY HRD 527 £19.95 THORN FV11 R/C £18.95

SUPER BUY

4M M/M Fly Leads 10 FOR £7.00

BRAND NEW TVs AND VIDEOS

BRANDED MAKE - 12 MONTHS PARTS WARRANTY - FULL SPARES BACK UP SERVICE INFORMATION AVAILABLE -**FULL BROCHURE ON REQUEST**

14" MONO TV UHF/VHF	£42.00
6" MONO TV WITH RADIO/CLOCK COMBINATION	£52.00
10" REMOTE CONTROL TV MAINS/BATTERY COLOUR TV	£140.00
14" REMOTE CONTROL COLOUR TV	£125.00
14" REMOTE CONTROL, TEXT, COLOUR TV	£155.00
14" MULTISYSTEM REMOTE CONTROL TV NTSC/SECAM ETC	.£143.00
20" REMOTE CONTROL TV	£165.00
20" REMOTE CONTROL TEXT TV	£192.00
28" FST REMOTE CONTROL TEXT TWIN SPEAKERS	.£359.00
25" STEREO NICAM FASTEXT TV	
28" STEREO NICAM FASTEXT TV	£387.00
VIDEO RECORDER, TWIN SPEED, REMOTE CONTROL, VHS	
8 EVENT, 30 DAY TIMER, UP TO 8 HOURS	£174.00
VHS VIDEO PLAYER, PLAY ONLY, MAINS/BATTERY	£128.00
14" COMBI VIDEO/TV REMOTE (2 TUNERS)	£330.00
21" FST MULTISYSTEM TELEVISION	£222.00
Will work on eleven different overcase evetoms	_

PAL/SECAM/NTSC etc. Has audio and video in & out

VIDEOCRYPT DECODER B GRADE...... £65.00

TRANSFORMERS JUST SWITCHES ASK!!

NIKKAI SPARES AVAILABLE

WE CAN'T LIST EVERYTHING THAT WE STOCK, OUR RANGE IS EXTENSIVE. WE HAVE A TRADE CATALOGUE ON REQUEST. WE ARE ALSO ON LUIS WITH MODIES. TO ORDER ANY PHILIPS MEDICAL PRINCIPLE OF THE PRINCIPLE OF

150p



HOW TO ORDER-Up to 1K ADD \$1.00 per order P+P (U.K.) Heavier parrels e.g., cable, service aids, degausing colls pieza-aliow \$2.05 P+P (U.K.) 5-pont orders changed it cons. First Class Mail is used whenever possible. Add 17.5% VAT to total except where it states zero rate Deer 3K will be served by carrier \$10.00 + VAT up to 2% (except tubes). We not despatch on Sarutray.



TRADE COUNTER

THERE IS VAT ON P+P.

60p 2SD-523

Goods are despatched on the day we receive your order, it for any reason we are out of stock we will try to inform y quickly as possible. We try our best to give a speedy, fair and efficient service: VAT invoice on request. Give us a min your you service. Panese act if with any one des into listed — we will try to help. Probes are subset to change without some cases we may have to supply an equivaient. We need expiry dates for credit card orders. MIN. ORDER ES. FI C FAST LONDON-COMPONENTS VIDEO SERVICE KITS FROM 24.99p, TA7270 260p 250p 2SA-726 25p 2SB0548 40p 2SC-1345 30p 2SC-2238

ELC EAST LONDON COMPONENTS	3V35/3V45 CASSETTE HOUSING VT33/VT65 CASSETTE HOUSING		TA7270 250 TA7271 250	2SA-733	20p 2SB-554	350p	2SC-1359	20p 2SC-2240	25p	2SD-525 70p	
AUDIO TELEVISION VIDEO	VR6467 CASSETTE HOUSING	£17.99p	TA7272 260	2SA-748	90p 2SB-557 300p 2SB-558	300p 300p	2SC-1368 2SC-1382	40p 2SC-2274 40p 2SC-2275	30p 50p	2SD-526 70p 2SD-560 50a	
COMPONENTS AT VERY KEEN PRICES	3V35 CAPSTAN MOTOR	£22.99p	TA7274 260 TA7280 299	20 4 700	130p 2SB-560	35p	2SC-1383	35p 2SC-2278	75p	2SD-570 40p	-1
TEL: 081-472 4871 FAX: 081-503 5926	VT11/VT33 CAPSTAN MOTOR MB3732	£24.99p 300n	TA7281 275	2SA-771	130p 2SB-561	20p	2SC-1384	35p 2SC-2320	25p	2SD-571 30p 2SD-592 20o	
	AN3821K 7950 CTV444	700a	TA7299 399		50p 2SB-562 60p 2SB-564	35p 78e	2SC-1393 2SC-1398	-30p 2SC-2335 70p 2SC-2371	120p 45o	2SD-592 20p 2SD-600 80p	
REMOTE CONTROLS FROM £9.99 VIDEO BELT KITS	AN3822K 795p STK430	500p	TA8201 350 TA8205 395	2SA-798	55p 2SB-566	110p	2SC-1399	60p 2SC-2427	80p	2SD-612 40p	- [
IDLER TYRES 50p HITACHI	AN5900 150n S1K433	490p	TA8210 350		25p 2SB-568 40p 2SB-595	40p	2SC-1403 2SC-1413A	250p 2SC-2440 240n 2SC-2458	70p 30n	2SD-613 70p 2SD-856 80p	- 1
VIDEO HEADS FROM £6.99 VT-11/33 £1.30	P AN7161 320p STK459	600p 780p	TA8214 350	2004 844	40p 2\$8-595 15p 2\$8-596	80p 75ø	2SC-1417	240p 2SC-2458 20p 2SC-2482	30p 40p	2SD-636 25p	- 1
Over 200 models at very attractive prices. VT-110/135 £1.80		750p	TA8215 390 TA8216 590	A DC & DC #	50p 2SB-618	325p	2SC-1445	250p 2SC-2500	30p	2SD-637 20 p	- 1
AKAI, AMSTRAD, FERGUSON, FISHER, FERGUSON	AN7178 275p STK0029	406p	TEA2018A 140	p 2SA-872	20p 2SB-631	40p	2SC-1446	60p 2SC-2501	85p	2SD-639 25 p	1
GOLDSTAR, HINARI, HITACHI, LOGI, 3V22 £1.80	p BA718 199p STK0040		TDA1044 275		15p 2SB-632 35p 2SB-633	40p 50p	2SC-1447 2SC-1454	75p 2SC-2502 320p 2SC-2537	90p 450a	2SD-641 310p 2SD-666 250	-1
MATSUL ORION PANASONIC SAISHO 3V29/30 £1.00	p BA6109 180p STK2025 BA6208 199p STK2129		TDA1170 150 TDA1515 250	Sn 2SA-899	60p 2SB-641	20p	2SC-1473	30p 2SC-2546	20p	2SD-667 25p	
CHADD AND MANY MODE 3V42/43 85	BA6209 1990 OTKOOCO		TDA1908A 180		35p 2SB-643 20p 2SB-644	20p 25p	2SC-1474 2SC-1475	45p 2SC-2550 45p 2SC-2555	70p 150p	2SD-669 40p 2SD-687 60p	- 1
3704.03 11.00	P BA6219 25Up STK3062		TDA2003 100 TOA2005 130	DCA OSE	30p 2SB-647	30p	2SC-1507	50a 2SC-2564	230p	2SO-716 120p	-1
VIUEU SPARES FISHER 3V29 TAKE UP IOLER \$1.00p FVH 615/725 \$1.10	BA6238 199n SIK4121	699p	TDA2030 130	p 2SA-916	30p 2SB-648	55p	2SC-1509	45p 2SC-2565	260p	2SO-718 130p	-
3V29 F/F REW IDLER \$2.60p FVH 905/910 \$1.10	BA6239 250p STK4131	650p	TDA2270 340		35p 2SB0649 10p 2SB-673	40p 80p	2SC-1514 2SC-1520	40p 2SC-2570 85p 2SC-2575	50p 25g	2SD-721 150p 2SD-725 350p	
3V59/65 FV10/14 IOLER £1.50p SANYD	BA6229 250p STK4132 BA6259 300p STK4141		TDA2577 200 TDA2579 250	004.040	50p 2SB0681	250p	2SC-1550	60p 2SC-2577	125p	2SO-745 250p	Į.
3V23 LOADING HOLLER BAR \$3.990 VUD1200 \$2.15	P CNX62A 300p STK4142	750p	TDA2600 575	2SA-950	25p 2SB-686	120p	2SC-1567	50p 2SC-2579	130p	2SD-748 150p	-1
SHARP 0005 & 0006 \$1.95p VHR3300 \$2.05 SHARP VC651 ASSEMBLY \$6.99p VHR3300 \$2.05	p HA1377 199p STK4151	680p	TDA3560 350 TDA3561 350		70p 2SB-688 60p 2SB-695	130p 325o	2SC-1568 2SC-1573	60p 2SC-2580 40p 2SC-2581	175p 200p	2SD-761 50p 2SO-773 30p	
VT11/14/17 IDLER \$1,950 AKAI	HA1392 230p STK4152 HA1394 250p STK4161	900p 799p	TDA3562 350	2SA-964	65p 2SB-705	200p	2SC-1577	800p 2SC-2582	40p	2SD-781 30p	1
VT11 CLUTCH ASSEMBLY £6.99p VS2/5FG £1.00	P HA1397 2500 STK4162	799p	TDA3565 300	p 2SA-965	25p 2SB-716 25p 2SB-717	30p	2SC-1584	600p 2SC-2603	20p	2SO-788 30p	1
VT100/225/260 IDLER \$2.75p V\$105/250 \$6.99	. Thursen look attents	850p	TDA3651 200 TDA3654 199	P 2SA-968	70p 2SB-718	70p	2SC-1627 2SC-1667	30p 2SC-2611 150p 2SC-2631	40p 40o	2SD-789 25p 2SD-792 340p	- 1
NEC 9013 IOLER	HA11235 160p STK4172 n HA11423 210p STK4181	899p 899p	TDA4500 395		15p 2SB-738 30p 2SB-738	25p	2SC-1669	85p 2SC-2634	40p	2SD-794 60p	
AKAI VS105/250 CLUTCH ASSEMBLY £11.99p VS300 £1.90	HA11711 650p STK4191	999p	TDA4501 450	p 2SA-985	65p 258-744	60p	2SC-1670 2SC-1675	85p 2SC-2660 20p 2SC-2688	85p 50o	2SD-822 490p 2SD-836 850	-1
SAISHO VR380 CLUTCH £4.99p VS380 £1.75	HA11724 800p STK4192	999p 600p	TDA4503 400 TDA4505 395		30p 258-755 20p 258-757	310p 350p	2SC-1677	80p 2SC-2753	50p	2SD-837 80n	ì
MITSUBISHI H5337 F/F IDLER 52.70p HINARI	HA13001 199p STK4372 HA13108 350p STK5332	350p	TDA4510 375	So 2SA-1015	20p 2SB-764	25p	2SC-1708	20p 2SC-2781	50p	2SD-1047 200p 2SD-845 250p	
ALBA SENTRA PULLEY £1,35p VXL3-20 £1.25 MATSUI LIMITER POST £1,25p VXL4-25 £1.50	p HA13118 299p STK5333	699p	TDA4600 200		20p 2SB-772 30p 2SB-792	45p 45p	2SC-1722 2SC-1756	60p 2SC-2785 40p 2SC-2791	50p 325p	2SD-850 250p	
PANASONIC NV270 IDIED C1 050	p HA13119 299p STK5338 HA13403V 550p STK5372	399p 399p	TDA8170 300 TDA8180 500	ZSA-1048	20p 2SB-793	35p	2SC-1758	30p 2SC-2792	275p	2SD-859 100p	
FISHER 615 IDLER C3 500 MITSUBISHI	_ LA4270 275p STK5211	699p	TDA8190 300		90p 2SB-817	200p	2SC-1760	85p 2SC-2944	175p	2SD-863 70p	
FISHER GEAR ASSEMBLY £4.50p HS306/307 £1.75	LA4440 240p STK5325		UPC1031 180 UPC1185 240	P 2SA-1094	190p 25B-837	60p	2SC-1775 2SC-1815	20p 2SC-3078 15c 2SC-3156	40p 325p	2SO-869 320p 2SD-870 320p	-1
AMSTRAD PINCH WHEEL MOD KIT \$5,990 SHARP UNIVERSAL TRIPLER \$4,990 VC651/681 \$1.25	LATTIC EDOP OTHER	650p 699p	UPC1188 240		180p 2SB-857	60p	2SC-1819	50p 2SC-3179	200p	2SD-871 329p	- 1
UNIVERSAL TRIPER WITH FOCUS £7.990 VC381 £1.20	n LA4461 160p STK5422	650p	UPC1230 210	Op 2SA-1104	200p 2SB-861	δ0p	2SC-1845	20p 2SC-3182	250p	2SD-880 40p	
HITACHI MODULE HM6251 £5.99p VC9300 £1.50	D LA4465 299p STK5466		UPC1225 220 UPC1277 240		200p 2SB-886 60p 2SC-789	65p 50p	2SC-1846 2SC-1848	45p 2SC-3284 45p 2SC-3298	175p 120p	2SD-882 70p 2SD-898B 260p	- 1
TENSION BAND FOR MOST MOD. FROM ££ 1.99p TV L.O.P.T.	1 A 4 4 7 5 399n STK 5481	499n	UPC1278 240	Op 2SA-1123	40p 2SC-790	80p	2SC-1875	260p 2SC-3506	250p	2SD-917 180p	- 1
CIRCUIT PROTECTOR ICP 80p TX90 White £18.99	P LA4476 399p STK5490		UPC1288 250 UPC1318 350		200p 2SC-815 65p 2SC-828	15p 25p	2SC-1890 2SC-1906	20p 2SC-3281 30p 2SD-198	299p 180o	2S0-951 175p 2SD-982 80p	. H
TX10 F0CUS UNIT \$7.99p TX100 Green £17.99 PHILIPS BACK-UP BATTERY £1.99p HINARI 4/5 £16.99		850p 4750	UPC1363 199 UPC1365 299		DUB 200, 820	20p	2SC-1909	250p 2SD-200	21 0 p	2SD-985 80p	- 1
ALBA BATTERY .1F 5.5V £2.50p FIDELITY 20 £12.99	n A4500 230n STK7348	450p	UPC1365 299 UPC1378 210		190p 2SC-839	25p	2SC-1913	100p 2SD-234	40p	2SD-1128 80p	- 1
TV SWITCHES FOR MOST MODELS FROM £1.00p HITACHI £19.99	p LA4505 260p STR441	450p 499p	UPC1394 190 UPC1420 525		60p 2SC-929 200n 2SC-941	20p 25p	2SC-1914 2SC-1922	30p 2SO-235 275p 2SD-288	40p 80o	2SD-1134 80p 2SD-1135 90p	- 1
SONY FUNCTION SWITCH £1.00p KV2704/5 £22.99 SCART TO SCART LEAO £3.99p KV2752 £22.99			TRANSISTORS	2SA-1220	50p 2SC-945	20p	2SC-1923	20p 2SD-299	160p	2SD-1138 60p	
SCART TO SCART LEAD £3.99p KV2752 £22.99	1A7520 300n SR2M	80p	TIPL791A 130 BUT11AF 120		175p 2SC-959 65p 2SC-984	65p	2SC-1941	40p 2SD-313	40p	2SD-1153 50p 2SD-1207 50p	- 1
	LA7530 400p STR4211 LA7800 180p STR4090	599p 595p	BUT11A 85	5p 2SA-1265	150p 2SC 998	40p 300p	2SC-1942 2SC-1945	190p 2SO-315 350p 2SO-325	75p 45p	2SO-1207 50p 2SO-1265 100p	
63 PLASHET GROVE, EAST HAM,	LA7800 180p STR4090 LA7801 195p STR4009		BUT56A 120 BU508AF 100		35p 2SC-1162	35p	2SC-1969	160p 2SO-331	80p	2SD-1267 140p	
LONDON E6 1AD. TEL: 081-472 4871	LA7820 299p STR5412	450p	BU508DF 130	Op 2SB-507	100p 250-1172	150p 45ø	2SC-1980 2SC-1986	25p 2SD-400 60p 2SD-401	20p 50o	2SD-1273 100p 2SD-1275 1250	
FAX: 081-503 5926 OPEN 9AM TO 7PM	tenant one CTDF000		S2000AF 150 S2055AF 150		190p 2SC-1173 190p 2SC-1195	200p	2SC-2003	25p 2SD-414	40p	2SO-1275 125p	
two minutes walk from Upton Park Tube Station	M490BB1 850p STR5404	1 550p	SG613 856	Op 2SB-1016	80p 2SC-1212	60p	2SC-2009	60p 2SO-421	60p	2SD-1397 200p	1
PLEASE PHONE US IF WHAT YOU NEED	M491BB1 850p STR5804 M545431 400n STR5904		SG264A 554 2SA473 33	0p 2SB-512 5p 2SB-514	100p 2SC-1213 100p 2SC-1214	60p	2SC-2022 2SC-2026	60p 2SD-424 450 2SD-426	350p. 300p.	2SD-1398 170p 2SD-1426 275e	- 1
IS NOT LISTED AS WE HOLD THOUSANDS	M54543L 400p STR5904 M54544L 400p STRD180		2SA672 30	Op 2SB-527	40p 2SC-1222	20p	2SC-2057	25p 2SD-427	300p	2SD-1427 275p	
OF ITEMS IN STOCK	M54545L 400p STRD18	6 599p		99 2SB-528 90 2SB-531	40p 2SC-1226	75p	2SC-2068	50p 2SO-428	300p	2SD-1432 460s 2SD-1439 200s	
ADD £1 P/P ADD 17.5% VAT	M54548L 450p SAA1251 M54549L 450p SAA1291	400p 900p	2SA683 25	5p 2SB-534	2000 200 1217	75p 25p	2SC-2073 2SC-2120	58p 2SD-438 15e 2SD-461	45p 100p	2SU-1439 200p 2SQ-1441 200p	1
ALL GOODS DESPATCHED SAME DAY	M54644L 400p SAA1294	1250p	2SA697 4	5p 2SB-536 5p 2SB-537	60p 2SC-1318	25p	2SC-2153	40p 2SD-468	250	2SD-1453 170p	
PRICE SUBJECT TO CHANGE WITHOUT NOTICE	M54648L 450p SAA5000	250p		5p 2SB-544	60p 2SC-1327	20p 25p	2SC- 2229 2SC- 2230	25p 2SD-471 30p 2SD-476	30p 60o	2SO-1497-02 520p 2SO-1497-06 520p	
VISA ACCESS ACCEPTED. MIN ORDER £5.00	M54649L 400p TA7193 MB3730 200p TA7240	400p 260p		Op 2SB-545 Op 2SB-546	78p 2SC-1328 78p 2SC-1344	25p 30p	2SC-2230 2SC-2236	30p 2SD-478	100p	2SJ-50 425p	
The state of the s	INDUISO COOP THIEFO	2.00p	-								-

HOW TO INCREASE YOUR PROFITS, IMPROVE YOUR SERVICE, WITH COST EFFECTIVE TEST EQUIPMENT.

HAMEG OSCILLOSCOPES

HAMEG are Europe's top selling DUAL TRACE OSCILLOSCOPES. Select from four superb models. All, with the exception of the HM 1005, incorporate a useful COMPONENT TESTER. Size - all models - 285mm x 145mm x 380mm. Clear display 8cm x 10cm. Mains supply: 110/22.240V X C.506.040V.

All supplied with 2 PROBES, a COMPREHENSIVE MANUAL and a 2 YEAR WARRANTY.

HM203-7 20MHz STANDARD



SPECIFICATION

- 2 Channels Bandwidth: DC 20MHz Sens: Ch.!, Ch.2, 1mV/cm
- Timebase: 0.1s 20ns/cm
 Tringering: DC 40MHz
 Tringering: DC 40MHz
 Active TV Sync Separator
 Variable hold-off
 Tringer LED indicator
 Calibrator: 1KHz Square wave
 Component tester

6

- Plus many features

Price £338.00 + £59.15 V.A.T. FREE Specialist Carrier Delivery

HM604 60MHz UNIVERSAL SPECIFICATIONS

- SPECIFICATIONS

 2 Channels

 Bandwidth: DC 60 MHz
 Sens: Ch.1, Ch.2, 1mV/cm
 Timebase : 2.5s 5ns/cm
 Triggering: DC 80MHz
 Active TV Sync Separator
 After delay trigger
 Sweep delay
 Delay line
 Trigger LED indicator
 Calibr ator: 1 KHz & 1MHz Sq.

- Calibrator: 1KHz & 1MHz Sq. Wave Component tester

Price £610.00 + £106.75 V.A.T. FREE Specialist Carrier Delivery

HM1005 100MHz UNIVERSAL



SPECIFICATION

- SPECIFICATION
 3 Channels
 Bandwidth: DC 100MHz
 Sens: Ch.1, Ch.2, Ch.3, 1mV/cm
 Timebase A: 2.5s 5ns/cm
 Triggering DC 130MHz
 After delay trigger
 Delay line
 Trigger LED indicator
 Overscan LED indicator

3 CHANNELS - UP TO 6 TRACES

Overscan LED indicator
* Overscan LED indicator
* Active TV - Sync - Separator
* Calibrator: 1KHz & 1 MHz Sq. W
FREE Specialist Carrier Delivery q. Wave

HM205-3 20MHz DIGITAL STORAGE

- SPECIFICATION
 * Digital Storage
 * Analogue real time (Same as 203-7)

- Analogue real time (2 same as 2 Bandwidth: DC 20MHz
 Sens: Ch.1, Ch.2, 1mV/cm
 Timebase Digital: 5s-1µs/cm
 Triggering DC 40MHz
 Active TV Sync Sampling
 Max sampling rate: 2 x 20MHz
 Memory: 2 x 2048 x 8 Bit
- Dot joiner
- Printer/plotter output

Price £610.00 + £106.75 V.A.T.



REJUVENATOR

Tests and rejuvenates blue green and red guns separately. Fitted with delta and P.I.L. sockets. Compact size 120 x 65 x 60mm. Supply 240V AC

Price £34.00 +

£5.95 V.A.T.

B.K.'s CRT TESTER DIGITAL CAPACITANCE METER 18.3 High accuracy 0.1pf-2.000 uf. LCD display

* LCU display.

* 8 ranges.

* Accuracy + /- 0.5%.

Full scale + /- 1 digit. Inc. protective case



LEADER FM STEREO SIGNAL GENERATOR

At last! A generator specifically designed for testing and fault finding on FM stereo and monaural VHF receivers including stereo multiplex circuits.

FEATURES

- Carrier frequency 100 + /- 1MHz (adjustable).
- Output level 0.1mV 10mV. Pilot signal 19KHz + /- 2Hz.

- PHOI signal 19MAT + /- ZHz.

 & R separation over 50dB.

 External Modulation 50Hz 15KHz.

 Pre-emphasis 50µs, 75µs & off.

 Comprehensive test lead set included.

 Mains powered.

 Size: 80 x 200 x 250mm.

Price £299.00 + £52.33 V.A.T.



LEADER HIGH VOLTAGE **METERED EHT PROBE**

Light weight, easy-to-grip high-impact plastic handle with arc-over protection and no need of extra equipment. An indispensible item in your TV service kit. Measures up to 40kV DC with safety and the greatest of ease. Entirely self-contained. Connect the lead clip to chassis and probe tip to the check point, read the meter for voltage

A must for the Health and Safety at Work Acts. Price £66.00 + £11.55 V.A.T.

B&K PRECISION CRT ANALYSER-RESTORER

The number one CRT Test Instrument. Over 5000 U.K. Television engineers wouldn't be without it.



* All CRT's checked Identically, including all In-line and one gun types * Tests all three guns of colour CRT's simultaneously under actual operating conditions (model 490) * Exclusive multiplex technique (model 490) * Measure true dynamic beam current that actually passes through G1 aperture to screen * Measures all shorts and leaks - preserving more CRT's * Tests focus electrodes lead continuity finding faults that other testers miss *Uses most powerful restoration method known with minimum danger to CRT * Rejuvenated CRT's guaranteed as new for two years * Obsolescence proof - perpetual set up chart updated and new adaptors developed * Tests and rejuvenates VDU's and oscilloscope tubes * A range of over 40 CRT base adaptors available * Increase profit * Pays for itself in months. All CRT's checked identically, including

profit * Pays for itself in months.

Prices			
Model 490 Tri-dynamic three meter instrument Inc. 6 common adaptors	£509.00	+ £89.0	8 V.A.T.
Without adaptors	£446.00	+ £78.05	5 V.A.T.
Model 480 Single meter instrument inc. 6 common adaptors	£375.00	+ £62.63	3 V.A.T.
Without adaptors	£310.00	+ £54.2	5 V.A.T.

SADELTA SIGNAL STRENGTH METERS

The Sadelta Field Strength Meters have been designed to facilitate the dish alignment of satellite TV systems and aerial alignment of VHF/UHF television and radio systems. Signal levels can be accurately measured on the TC402-C and the TC90, allowing the evaluation of signal conditions for satisfactory operation. Both models have a clear LCD direct frequency readout, coupled to a multiturn tuning control enabling precise channel identification.

TC402-C VHF & UHF

FEATURES

- Three bands: Low VHF: 45-110MHz High VHF: 110-300MHz
- : 470-862MHz
- UHF : 470-862MM2
 Digital display for direct frequency readout.
 Built-in monitor loudspeaker AM/FM.
 Signal measurement from 20µ V to 100mV.
 Powered by eight 1.5 Ab atteries.
 Fully portable with sturdy carrying case.



Price 259.00 + £45.33 V.A.T.

TC90 VHF-UHF- SAT.

FEATURES

- Five bands:
- Low VHF : 45-110MHz High VHF : 110-300MHz Hyper VHF : 300-470MHz VHF : 470-862MHz
- Satellite
- : 950-1750MHz
- Digital display for direct frequency readout. Signal measurement VHF/UHF 20µV to 3V. Signal measurement satellite -70dBm to -10dBm.
- Audible indication of satellite signal level.
 Built-in-monitor loudspeaker AM/FM

Price £ 499.80 + £87.47 V.A.T.

(not satellite). * Powered by rechargable battery (complete with charger 220/240V AC). * Fully portable with sturdy carry case. **BLACK STAR COLOUR PATTERN GENERATOR** THE 'ORION' THREE-IN-ONE

PAL VHF/UHF - PAL VIDEO COMPOSITE - R.G.B. The Orion is a compact, bench instrument offering a wide range of patterns and facilities at a

In addition to a switchable sound carrier facility which allows use with the majority of PAL TV systems, the Orion provides highly flexible RGB outputs, ensuring compatibility with most video monitors.

More than 50 pattern combinations can be selected, including those for testing static and dynamic divergence, video amplifier linearity, colour purity, general colour performance, focus A separate video input to modulate camera signals; fully variable RF and video output levels facilitating AGC testing; trigger output allowing easy triggering of difficult oscilloscope waveforms; external sound modulation input via DIN connector for frequency response testing of TV sound systems; adjustable wide frequency coverage of VHF and UHF TV bands.

Just some of the features making the Orion Pattern Generator an indispensible tool in the manufacture, test, and servicing of televisions, and computer and video monitors.

EATURES

- Colour bars, purity, greyscale, crooshatch,
- dots, focus, etc. VHF/UHF Channels 5.5MHz, 6.0MHz, 6.5MHz Sound Carriers.
- Internal/External Sound. External Video Output
- PAL B,D,G,H,I,K.
 Separate R, G, B and sync. O/P's.
 RGB @ TTL & 1V.
- Green + 0.3V Syncs. Composite Video Output.

Variable RF/Video Output. Switchable Video Polarity. Mains powered 220/240V AC 50/60Hz. Size: 98 x 219 x 240mm.



Price £229.00 + £40.08 V.A.T.

BARCLAYCARD VISA

U.K. POST PAID, export enquiries welcome. Visa/Access or cheque with order, payable B. K. Electronics. Official Orders welcome from Govt. Depts., colleges, P.L.C.s etc. Large (A5) S.A.E. for technical teaflets of complete range. Credit card orders are accepted by phone, fax or post. Delivery normally within seven days.



B. K. ELEC UNITS 1& 5 COMET WA ESSEX Tel.: 0702 - 527572 SS26TR Fax.: 0702 - 420243

WE SERVICE. SUPPLY,

Receivers Dishes **Actuators LNBs Polorators** Decoders Leads **Connectors** Wall Mount Stands

Splitters Plugs Amplifiers Clips

Fittings

Aerials Masts Cable **Brackets** Lashings

All aerial and satellite equipment supplied at best prices. All Work Guaranteed Free Estimated



COMMERCIAL INSTALLATIONS/MULTI-USER SYSTEMS, DOMESTIC INSTALLATIONS HOTELS, FLATS, PUBS & RESIDENTIAL, HOMES ETC ETC

FIXED SYSTEMS

TURKISH YUGOSLAVIAN **EGYPTIAN** ITAI IAN FRENCH RUSSIAN

MOTORISED SYSTEMS

MONTEREY 40 DRAKE ESR 250E **PACE 9200**

ASTRA SYSTEMS

NEC 4012 IRD PACE 9200 IRD AMSTRAD 400 IRD



TRADE MAIL ORDER

FAX: 081 804 4609



SHOWROOM 543 HERTFORD RD, ENFIELD EN3 5UQ

/E HAVE THE WIDEST CHOICE OF USED OSCILLOSCOPES IN THE COUNTRY

TEKTRONIX 24458 Four Channel 150MHZ	£2000
TEKTRONIX 2445A Four Channel 150MHZ Delay Sweep	£1500
TEKTRONIX 485 Dual Trace 350MHZ Delay Sweep	0083
TEKTRONIX 475 Qual Trace 200MHZ Delay Sweep	Ω550
SCHLUMBERGER 5218 Dual Trace 200MHZ Delay Sweep	2550
THE CHARGE OF DOLL THE COMMENT DOLL OF SWEEP	
HITACHI V650F Dual Trace 60MHZ Delay Sweep	£400
TEKTRONIX 2225 Dual Trace 50MHZ Delay Sweep	. £500
TEKTRONIX 465 Dual Trace 100MHZ	£450
PHILIPS PM3217 Dual Trace 50MHZ Delay Sweep	£400
TELEQUIPMENT D75 Dual Trace 50MHZ Deley Sweep	€200
TELEQUIPMENT V3 Differential Amplifier	£40
HAMAG 605 Dual Trace 60MHZ Delay Sweep	£400
HAMAG 705 Dual Trace 70MHZ Oelay Sweep	
GOULD 0S300 Qual Trace 20MHZ	
HITACHI V212 Dual Trace 20MHZ	€250
TRIO CS1022 Dual Trace 20MHZ	£225

THIS IS JUST A SAMPLE - MANY OTHERS AVAILABLE

THIS IS SOUT A SAINT LL - MAINT OTHERS AVAIL	MDLE
ELECTRON MICROSCOPES A E.J. CORINTH 500-TRANSMISSION I S.I. SUPER 111A-SCANNING	`
RACAL/DANA Widehand Level Metrs 5002 RACAL/DANA (AIN) LCR Oatabridge 9341 TEKTROMIX 577 Curve Tracer with 7271 Indure WAYNE KERR LCR4250 with Bining Option RACAL/DANA (AIM) LCR Oatabridge 9341 WAYNE KERR LCR Meter 4210 WAYNE KERR Automatic Component Bridge 8605 WAYNE KERR BAUMORAIC COmponent Bridge 8605 WAYNE KERR BIOTISTE 1878 BRIDGE 8602 FARNELL SYNTHESEED SCRIBLING 105CT —	£350 £3000 £2250 £600 £600 £450
MARCONI TF2015 AMIFM 10:520MHZ Sig Gen	£275 £300
with TF2171 MARCONI TF2015 without Synchroniser TF2171 MARCONI TF2016 AM-FM 10KHZ-120MHZ with TF2173 MARCONI TF2016 without Synchroniser TF2173 MARCONI TF2056/2357 Level Osc/Meter 20MHZ The ; MARCONI SANDERS Sig Sources Vanous models	£350 £175
covering 400MHZ-8.5GHZ Fr RACAL 9009 Mod Meter 10MHZ-1.5GHZ FR RACAL 9009 Mod Meter 10MHZ-1.5GHZ TEKTRONIX Waveformer Monitor type 528 RACAL Instrumentation Recorders Store 40 8.7D Fr KEITHLEY 224 Programmable Current Source FERROGRAPHY RTS2 Recorder Test Set Fr	£300 £300 om £500 £1000
	_

PHILIPS PM2525 MULTIFUNCTION DMM 41/2-51/2 digit with GP1B/IEEE-488 ONLY £300

4 ½-5 ½ digit with per particle read on the Ecology THURIBY PL 2021 (7.9 Bench PS) -300 ½ Amp Twice with GPIB ONLY 1250 ANDHELD MULTIMETERS 3 ½ digit. DM105 — 14 ranges DC-2Amp ONLY 118 M2355 — 32 Amp ONLY 118 M255

MARCONI TF2700 Universal LCR Bridge, Battery From £125	MANNESMAN TALLY Proy 3 XY Plotter RS232 PHILIPS PM5131 Function Gen 0 THZ-2MHZ. From	£150 £100
	MARCONI TF2337A Auto Distort Meter 400HZ/1KHZ 0.01%	TI £125 £175

Test Set No 1, 8× 9SX	£65
8 Mk5 with Carrying Case 8 Mk6 with Carrying Case	093. £120
All meters suppli	ed with Batteries & Leads
SOLARTRON 7045 Multimete	er 4 / 2 digit 30 ranges Auto Man £95
Large Range Bench Power S	upplies From £40

BRUEL & KJAER Sound Level Meter 2206-V2* mic. With carrying case. £16 Sound Level Meter 2203 with 1* mip. From £22 Mics awalable — 1* 4117 & 4143, 1/2* 4134 £22 Pre Amp 2613; 2615; & 2630 OTHER B & K EQUIPMENT AVAILABLE
LEVELL TMGB Broadband Voltmeter 1HZ-450MHZ. 150V-5000V LEVELL TMJB AC Microvoltmeter 1HZ-3MHZ. 30V-500V SEVELL TMJB AC Milthoothmeter 1HZ-3MHZ. 30V-500V LEVELL TMJB AC Milthoothmeter 1HZ-3MHZ. 150V-500V LEVELL TMJB AC Milthoothmeter 1HZ-3MHZ. 150V-500V LEVELL Coscillator 16152-3HZ-300KHZ Sine/Sq. 151Z LEVELL Oscillator 16152-3HZ-300KHZ Sine/Sq. 151Z LEVELL Decade 0Sc 1F66A 0 ZFL 1 ZBMLZ LOW Distortion MANY MORE ITEMS AT RIDICULOUS PRICES—LST Available

MANY MORE ITEMS AT RIDICULOUS PRICES — LIST AVAI	lable
NEW EQUIPMENT	
HAMEG OSCILLOSCOPE HM1005 Triple Trace 100MHZ Del	ay
Timebase HAMAG OSCILLOSCOPE HM 804 Due! Trace 60MHZ Oelay	£792
Sweep .	£610
HAMÉG OSCILLOSCOPE HM2037 Dual Trace 20MHZ	
Component Tester HAMEG OSCILLOSCOPE HM2053 Dual Trace 20MHZ Digital	£338
Storage	! የ61በ
All other models available. All oscilloscopes supplied with 2 or	

APPOLLO 10 — 200MHZ Counter Timer Radio/Time Inter	val
etc	£295
METEOR 100 FREQUENCY COUNTER 100MHZ	£109
METEOR 800 FREQUENCY COUNTER 800MHZ.	£135
METEOR 100 FREQUENCY COUNTER 1GHZ. JUPITOR 500 FUNCTION GENERATOR 0.1HZ-500KHZ.	£178
Sine/Sq/In	£110
ORION COLOUR BAR GENERATOR Pai/TV/Video All other Black Star Equipment available	£229
OCCUL ACCORD DECREE Contabable v1:v10 (D8 D) C3)	C11

Used Equipment — With 30 days guarantee. Manuals supplied if possible.

This is a VERY SMALL SAMPLE OF STOCK SAF or Telephone for lists. Please check availability before ordering. CARRIAGE and Lord of Lord of Boods and Carriage.



STEWART of READING 110 WYKEHAM ROAD, READING, BERKS RG6 1PL Telephone: 0734 958041 Fax: (0734) 951696 Callers Welcome 9am-5.30pm Mon-Fri (until 8pm Thurs)

BARCLAYCARD VISA

This month's **★ SPECIAL OFFER ★**

14" and 16" narrow necked portable tubes, only

£39

Other tubes on offer

50-120 (20" mono)	£5
510VSB22	£29
51-580	£44
56-500	
56-701, 56-708	£49

Hundreds of tubes in stock. Ring quoting tube number for prices PARCLAYCARD



Carriage and VAT extra



The Mill, Mill Lane, **RUGELEY. Staffs WS15 2JW** Геl: 0889-577600 Fax: 0889-575600

WHATEVER YOU NEED IN SATELLITE TV EQUIPMENT, WE HAVE THE SOLUTION.



Satellite Solutions offers an unbeatable service for SMATV and all multi-viewer TV systems.

We have the best equipment at the most competitive prices. But most importantly, every item is available with our famous Installer/Contractor technical and **on-site** support. This ensures you success with TV system contracts of every size.

In fact, **Satellite Solutions** can make even the largest, most complex projects risk free for you with the following products and services:

- **★**On-Site Survey
- ★Full Design & Installation Support
- ★Full Range of Equipment
- ★Leading Names in Satellite TV
- ★ Widest Range of Test Equipment
- ★Repair & Maintenance Contracts
- ★Regular Trade Newsletter
- ★Pro. and Domestic LNBs
- ★LNB Components
- ★ Wide Range of Dishes
- wide Kange of Dishe
- ★Pro. HV Switches
- ★Head End Equipment
- **★**UHF/VHF Products
- ★Wide Accessory Range

So call Jo Griffiths on the HELPLINE for your FREE copy of our *Trade Only Catalogue* offering the best **Satellite Solutions** around.

HELPLINE 0604 670900

SATELLITE SOLUTIONS

35 Quarry Park Close, Moulton Park, Northampton NN3 1QB Fax: (0604) 671343



VISA



IF YOU CAN'T AFFORD A JUMBO BUY THE TRIS

TRISTAR MANUFACTURING is a company presently at the forefront in a new wave of Eco awareness in the highly competitive world of television manufacture and have proved this with the launch of the RCT2203. The only television that is truly "environmentally friendly" in all of its manufacturing processes.

THE TUBE

The tube has been fully recycled and carries two years full manufacturers warranty.

THE CABINET

All cabinets re-made from 30% recycled plastic and designed with the customer in mind.

THE COMPONENTS

The components obviously have to be of the highest possible standard so our technicians are trained to reject any part that cannot be wholly relied upon.

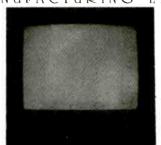
TELETEXT

All sets are equipped with the Teletext Service.

GUARANTEE

12 months Parts.





THE TRISTAR **RCT2203**

22" TELETEXT TELEVISION

Tristar Manufacturing 15 Regal Road Weasenham Lane Industrial Estate Wisbech Tel: 0945 588123

Up to 5 year insurance is available.

REMOTE CONTROL

The set comes with full remote control and has 16 electronically tuned channels.

PRICES **VALID JULY '92**

SINGLE UNIT @ £148.00 5 UNITS PLUS @ £141.00 10 UNITS PLUS @ £135.00 ALL PRICES EXCLUDE V.A.T.

ACCOUNTS

All accounts must be conducted on a STRICT C.O.D. BASIS.

Although an account scheme may later be implemented.

RECOMMENDED RETAIL PRICE

of this set £249.00 although we have found £239.00 to be the average.

Should you require a visit from one of our Representatives please telephone us on the number on the back of this publication.

COMPONENTS For TV ★ Video Audio ★ Computer

THIS IS JUST A SMALL SAMPLE OF STOCK 0452 526883 TRANSISTORS & DIODES

Z3A304	2.1.19	2002001	E1.39	ANISTHAD		Er 3014	
2SA608	£0.98	2SC2621	£1.57	IC 40010 G.Array IC AY38912A IC HA13408 (PCW) IC HD6845SP IC LA4140 IC LA6324	£18.86	C780108D031 CPU	€30.24
2SA673	£0.33	2SC3150	£2.93	IC AY38912A	£6.32	HA13007 T. Array	£4.66
2SA683	£0.33 £0.83 £1.01 £0.41 £0.49	2SC3156	£4.97	IC HA13408 (PCW)	£7.67	SINCLAIR	
2SA715	£1.01	2SD313	£0 49	IC HD6845SP	£15.18	IC 40054 ROM	£16.99
2SA844	£0.41	2SD325	£0.71	IC LA4140	£1.70	IC ROM (48K/+)	P7 99
2SA984	20.49	2SD389	£1.09	IC LA6324	€4.11	IC TEASOOO	DA 40
2SA1011	£1.51	2SD401A	£1 39	IC PEGA1A (PC1640)	£30.85	IC TMC4600 16ML4	01.70
2SA1015GR	£0.74	2SD468C	£0 76	IC SED9420CAC	£14.93	IC 111 ACCDD+57	C16 27
2SA1706	£1.69	2SD571	€0.94	Joystick (CPC range)	£6.71	IC ULABCUUTE/	210.77
2SB507	£1.23	2SD880	€0.97	Printer Armature	20.7	IC 40954 RDM IC ROM (48K/+) IC TEA2000 IC TMS4532-15NL4 IC ULA6C0D1E7 IC ZX8302 (0L) IC ZX8401 (Spec.) ZTX213 Transistor ZTX650 Transistor UM1233 Modulator Membrane (Spec. 48K) Membrane (4,41094K)	110.48
2SB772	£1.49	2SD787	£0.94	(PCW 9512)	£4.20	IU ZX8401 (Spec.)	17.94
2SC388A	£1.49	2SD788	£1.18	Cement Resistor 5 6R/5W	14.60	ZTX213 Transistor	EU 28
2SC1096	20.71	2SD917	£3.52	(Manuface)	£1.69	ZTX650 Transistor	£0.49
2SC1096 2SC1383	20.93	2SD1111	20.95	Conventations)	11.09	UM1233 Modulator	£6.56
2SC1384		2SD1266	£2 11	Service Manual	£8.49	Membrane (Spec. 48K)	£4.73
	£0.83		12 11	(CPC464 Barry)	1.8.49	Membrane (+/128K)	£8.39
2SC1741	£0.53	2SD1397	£4.49	Service Manual	040.00	Bubble Mat (+/128K)	£1.18
2SC1756	£1.49	2SD1426	£4.86	(PUW8256/8512)	£13.89	Speaker (48K/+)	£1.55
2SC1815Y	£0.28	2SD1667	£1.58	(Monitors) Service Manual (CPC464 early) Service Manual (PCW8256/8512) User Manual CPC464	£10.95	PCB Power Skt. (Spec.)	€0.65
2SC1907	£0.89	2SD1668	£1.87	ATARI		Membrane (+/128K) Bubble Mat (+/128K) Speaker (48KV+) PCB Power Skt. (Spec.) Power Plug (Spec.)	£0.29 £3.49
25C2060	20.97	8A157	£0.29	IC C014806 (XE/L)	£11 40	Edge Conn. (28way)	£3.49
2SC2271	£1.10	RD9.1EB2	£1.43	IC C029947 (XE/L)	£4.49	COMMODORE	
2SC2274	£0.48	1N4148	£0.04	THERMISTOR (ST-PSU)			£19.95
				IC TL431 (ST-PSU)	£1.20	IC 6561 VIC	£19.95
1	IC SELE	CHON		CNY65 (ST-PSU)	€4.42	IC 6561 VIC IC 8520 CIA IC 251641-02 PLA IC 90125-01 ROM IC 906215-01 PLA Modulator 251916-02	£11.22
HA1137W	£3.61	TA7607	€4.75	DC101 (07 DC11)	€4.73	IC 251641-02 PLA	13.98
HA11235	£3.65	TA76688P	£1.99	PC101 (ST-PSU) PC713V (STE-PSU)	£2.94	IC 901225-01 ROM	£6.55
HA12006	£6.09	TBA530	£1 74	FG/139 (31E-F3U)	12.34	IC 906114-01 PLA	£9.24
HA12413	£5.05	TBA800	€1.17	PHILIPS Serv. Manual BM7513 Serv. Manual CM8833		Modulator 251916-02	£18.76
LA1385	£3.85	TBAB10P	£1.16	Serv. Manual BM7513	1,2.99	User Manual (CO4)	14.60
LA3160	£2.28	TBA810S	£1.62	Serv Manual CM8833	€3.80	Serv. Manual (A500)	£19.95
LA3361	£1.79	TBA820L	£1.67	All ahove ar	e manuda	cturers original spares	
LA4500	£3.69	TCA940	£3.33				
LA7851	£2.28 £1.79 £3.69 £3.95	TDA1001B	£2 86	I OTHER	I COMI	PUTER CHIPS	
LM733CN	£2.27	TDA1020	£2.93	AM26LS31PC 6502 CPU 6522 VIA 6818 R.T., Clock 8255A PPI 8272A FDC	£1.63	74LS00 TTL	£0.18
M54548L	₹5.29	TOA1908A	£2.06	6502 CPU	£5.05	74LS157 TTL	£0.35
MC7805	£0.78	TDA2003	£2.84	6522 VIA	C4 40	75154PC 4×line driver	£1.85
MC14502BCF	£0.78	TDA2541	\$2.52	E010 D.T. Cloub	C7 24	64K×1 ORAM (120ns)	£1.99
SAA1124	£3.88	TDA3330	26.49	POCEA DDI	E7.24	64K×1 DRAM (150ns)	£1.69
SAA1294-2	£12.99	TDA4601	£2.49	0233A FF1	014.00	64K×1 DRAM (150ffs)	£2 99
	£12.99		£3.53	0272A FUG	114.09	64K×4 DRAM (100ns)	12 99
TA7240AP	£2.96	TDA8170	13.53	ALIDIO	TV & V	IDEO SPARES	
TA7273P	£5 35	UPC1277	£4.70	AMSTRAD VCR4500, 4600,	1700 TVP	1.3 BELT KIT	€2.45
TA7280P	€6.92	UPC1378H	£2.45	FIGURE DAY DAYS FOR FOR	DEEL COC	O TVDE	£1.79
TA7324	£3.21	14DN476	£19.29	FIGURE ON MC 2000 16 0	ULET SLO	DINCH BOLLED	£1.79
7015	DUONE 4	COECCO	HEC	FERGUSURVIVU 3VUU, 16, 24	4/mm3300	PINUT RULLER	£3.17
		CCESSOF		AMSTRAD VCR4500, 4600, FISHER FVH-P420, 520, 530 FERGUSDN/JVC 3V02, 50/HF FERGUSDN/JVC 3V29, 30/HF GEC STR6020 MDD KIT GEC/HITACHI V4004/VT11, 3	17200, 730	JU KEEL IULEK	
BT Plug-in Tir			£6 95	GEUSTROUZU MUD KIT		5.0	£7.61
5m Extension	Lead		£4.20	GEC/HITACHI V4004/VT11, 3	3 AIOED H	EAU	£22.99

B F Mind-ill Tibe willder		10 33
5m Extension Lead		€4.20
LJU2 Secondary Skt. & Box		£2.30
LJU3 Secondary Skt. (Flush)		\$2.67
4 Core Cable	per/m	£0.18
Cable Clips	per/10	£0.20

TOOLS & BATTERY ACCS

UNIROSS Plug-in 'Fast' Charger	
for AAA/AA NI-CAD's	£5.49
UNIROSS 'C' Ni-Cad. Battery	£2.09
WELLER WM120 Micropoint Minl-	
Soldering Iron 12W/240Vac	€8.25
'Universal' Crimping Tool	£2.45
Soldering Iron 12W/240Vac 'Universal' Crimping Tool Junior Hacksaw	20.80

MAIL ORDER ONLY PLEASE ADD 95p (UK) Post & Packing BUT NOT VAT.

Stock items normally despatched on the day we receive an order.

	on your requirements.		0402 0200					
Т	CAMBITAD CAMBITAD							
- 1	AMSTRAB	O . L	FRON	- 1				
- 1	IC 40010 C Assess	C10 0C	C79040BD024 CBU	P20 21				
- 1	IC 40010 G.Array	L10.00	HA12007 T Arrow	DA 66				
- 1	IC H\$13409 (DCM)	£0.32	national Fallay	14.00				
- 1	IC HUCGARED	C15 19	SINCLAIR					
- 1	10 1 44140	£13.10	IC 40054 RDM	£16.99				
- 1	IC LA6324	£4.11	IC ROM (48K/+)	£7.99				
- 1	IC PEGA1A (PC1640)	C30 85	IC TEA2000	14.49				
- 1	IC SED0420CAC	£14 Q3	IC 1M54532-15NL4	£1 72				
- 1	Joystick (CPC range)	£6.71	IC ULABGUUTE/	210.77				
- 1	Printer Armature	20.7	IL 288302 (UL)	110.40				
- 1	(PCw 9512)	£4.20	IU ZX8401 (Spec.)	17.94				
- 1	Cement Resistor 5 68/5W	24.60	ZTXCEO Transistor	EU 28				
- 1	(Monitors)	£1.69	LIMITOR Madulator	E0.45				
- 8	Service Manual		Mambrana (Spac 18K)	C4 72				
- 1	(CPC464 early)	£8.49	Membrane (±/129K)	C8 30				
Į.	Service Manual		Ruhhla Mat (+/128K)	C1 18				
- 1	(PCW8256/8512)	£13.89	Speaker (49K/+)	£1.10				
- 1	User Manual CPC464	£10.95	PCR Power Skt (Spec)	£0.65				
- 1	ΔTΔRI		Power Plun (Spec.)	£0.00				
- 1	IC C014806 (XEA.)	£11 40	Edge Conn (28way)	F3 49				
- 1	IC C029947 (XE/L)	£4.49	COMMODORE					
- 1	THERMISTOR (ST-PSU)	£1.34	IC SEET VIC	C10 05				
- 1	IC TL431 (ST-PSU)	£1.20	IC 0530 PIC	C11 22				
- 1	CNY65 (ST-PSU)	£4.42	IC 0520 GIA	C3 08				
- 1	PC101 (ST-PSU)	€4.73	IC 001225-01 ROM	C6 55				
- 1	PC713V (STE-PSU)	£2.94	IC 906114-01 PLA	£9 24				
- 1	PHILIPS		Modulator 251916-02	£18.76				
- 1	Serv. Manual BM7513	£2 99	User Manual (C64)	€4.25				
- 1	Serv. Manual CM8833	€3.80	Serv. Manual (A500)	£19.95				
- 1	All above a	na manuda	of years original spares					
- 1	OTUE	3 00 141	Serv. Manual (ASO) cturers original spares yUTER CHIPS 74.S00 TIL 74.S157 TIL 75154PC 4 XIIIn driver 64KX 1 DRAM (150ns) 64KX 1 DRAM (150ns) 64KX 1 DRAM (100ns) 10EO SPARES 33 BELT KIT OL TYMER 100 TEEL IOLER EAD SION BAND	- 1				
- 1	UITE	COM	O I ER CHIPS	00.40				
- 1	AM20LS31PU	11.03	74LS00 11L	£0.18				
- 1	5502 CPU	20.00	74LS157 IIL	EU.35				
- 1	ERIOD T Clock	£4.49	73134PU 4 X line brive!	£1.00				
-1	BOREN DDI	C2 B2	CAN U 1 DDAM (150ms)	C1 50				
- 1	82724 FDC	£14.00	64K > 4 DRAM (100ns)	C2 00				
- 1	0272A100		OHRAN DIAMI (TOOTIS)	LE 33				
- 1	AUDIO,	TV & V	IDEO SPARES					
_	AMSTRAD VCR4500, 4600,	4700, TVR	1-3 BELT KIT	22.45				
- 1	FISHER FVH-P420, 520, 530	REEL/SPU	OL TYRE	£1.79				
- 1	FERGUSUN/JVC 3V00, 16, 2	4/HR3300	PINCH RULLER	£5.17				
- 1	FERGUSUN/JVC 3V29, 30/H	H7200, 730	N KEEL IULEK	13.55				
- I	GEC STRIBUZU MUDI KIT	ייייייייייייייייייייייייייייייייייייייי	EAD	27.61				
-1	DANACONIC NUOSO 450 45	N VIUEU H	EAU ICION GAND	222.99				
- 1	DUILIDE MEANAGE DUICE	JANUA I EN	UPAR PUICE	C10.00				
- 1	CHADD DCC278 281 284 L	MANUAL		£10.00				
- 1	TOCUIDA CTION MAINIC TO	VINCEUDINE	P	E1.40				
- 1	TRIUMPH VR9511S CAPSTA	IN MOTOR	.n	F34 99				
- 1	INIDIAL LE AUGULTO CALOTE	NO IDEN		LU4.33				

We are pleased to serve both the Trade and End User SEND LARGE S.A.E. FOR CATALOGUE* or ask for a free copy with your first order

* Supplement available to Bona fide traders – on request

All items subject to availability - Prices can change without notice.

MARAPET (TVC) 1 HORNBEAM MEWS GLOUCESTER GL2 0UE

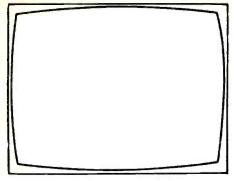
TRON

+ WIRELESS WORLD

SIX PAGES OF ELECTRONIC CIRCUIT DESIGN EVERY MONTH

Subscribe today and save £10

Simply phone our credit card hotline on 0789 200 255 for a special subscription price of £20 for 12 issues*.



EDITOR

John A. Reddihough

EDITORIAL ASSISTANT

Tessa Winford

Please note that the telephone numbers below are for contact with the advertisement departments only. Editorial enquiries should be sent to the editor at the address given on page 313 or faxed to 081-652 8956.

ADVERTISEMENT MANAGER

Jan Thorpe 081-652 8114

DISPLAY SALES MANAGER

Shona Finnie 081-652 8115

CLASSIFIED SALES EXECUTIVE

Pat Bunce 081-652 8339 Fax 081-652 8931

ASSISTANT CLASSIFIED MANAGER

Carol Nobbs 081-652 8327

GROUP CLASSIFIED MANAGER

Breda James 081-652 8327

ADVERTISING ADMINISTRATION

Kathy Lambart 081-652 8116

ADVERTISING PRODUCTION

Brian Chapman 081-652 8681 Fax 081-652 8917

READER HELPLINE

For help if you have difficulty obtaining *Television* phone 081-652 8620

SUBSCRIPTION ENQUIRIES

0444 440 421

SUBSCRIPTION HOTLINE

24-hour subscription ordering with credit card number phone 0789-200 255

PUBLISHER

Robert Marcus 081-652 3930

COVER PHOTO

This month's cover photograph shows the Philips DMP series VCR deck – see servicing article on pages 336-9.



TELEVISION

Tide Change?

We have grown used to Japanese dominance of the world's consumer electronics market. By offering reliable, quality products and introducing constant innovation the Japanese have been able to drive the market during the last two decades. Not that all innovation has come from Japan. Philips stands out as a leader in the field. Think for example of the compact audio cassette, laser disc technology and now the digital compact cassette. Philips provided the initial impetus to the video market, with its N1500 and N1700 series machines, while camera tubes and the modern c.r.t. with its computer-designed yoke are other areas in which Philips has led the way. But the firm seems to have been unable to profit from its initiatives. Poor marketing of its innovative products along with the severe competition provided by the Japanese and, over the past decade, other Far Eastern consumer electronics firms have led to a dismal profits record – in fact to losses in recent times.

Could the unthinkable happen: could leading Japanese consumer electronies firms find themselves in the same plight? The markets have certainly changed, with video, except for camcorders, following TV as a saturated market in decline. In many major markets VCR sales are now falling. Couple this with the world-wide recession, intense competition and the enormous cost of research and you end up with an economic crunch. To such an extent that even research-driven Sony is planning to cut spending in its next financial year – by around thirty per cent. Both Sony and Matsushita have had to grapple recently with the results of their forays into the software markets – Sony's purchase of Columbia Pictures and Matsushita's take over of MCA a couple of years back. These have been a drain on both resources and management time. Then there have been the attempts to diversify in the electronics field. Most Japanese consumer electronics manufacturers, seeing market saturation ahead, decided some years back to venture into the IT, semiconductor and other fields, at considerable expense. But these too are suffering in the recessionary climate of the present, and if too many firms decide to follow the same course the end result is over-supplied markets.

Great hope is placed on HDTV as a possible saviour, along with other developments such as DCC, the Mini Disc and multimedia devices. The problem at present is a gap in product introduction and the enormous cost of development – such that even the largest companies are increasingly having to think in terms of joint ventures. This is having some interesting results, in particular a possible renaissance of the US consumer electronics industry. The latter would be ironical when you consider that the last indigenous US TV manufacturer, Zenith, is at present in the process of ending US production and moving its manufacturing across the border to Mexico – a course previously followed by more than a few electronics manufactures. The intriguing thing is the joint-venture links being formed between Japanese and US firms in order to fund research and product development. US know-how in the computer and semiconductor fields could well lead to a higher profile for the USA in the consumer electronics market. In particular HDTV is proving to be enormously costly and it must be questionable whether pouring money into the Japanese HDTV system, which is based on outdated technology, is going to be worthwhile. Increasingly it looks as though the work that has been done in the USA on digital TV is the key to future development in this field. Getting there first at the right price is still crucial however. In this connection the announcement by Sharp at the beginning of February that it is to introduce a 36in. NHK/MUSE HDTV receiver to sell in Japan at the equivalent of around £4,500 is something of a breakthrough: the price is less than a third of that previously regarded as the norm in Japan. Sharp is hoping that the summer Olympics will give the market a boost. Increased production would reduce costs significantly, and Sharp claims to have developed a set of decoder chips that have made an appreciable contribution to price reduction.

High Street Shake-out

In view of the current poor trading conditions – though Dixons reported an improvement in December – the announcement by Thorn EMI that it intends to cease selling consumer electronics goods through its Rumbelows retail chain does not come as a complete surprise. Thorn had been trying to sell Rumbelows for the past three years, during which the chain has run up losses estimated at around £50m. There are some 450 shops in the Rumbelows chain, which has about six per cent of the market. The plan is to merge most of the Rumbelows outlets with the company's rental chains, saving on head office, distribution and servicing costs. It seems that around 200 of the outlets will eventually be closed. Job losses of around 800 are being talked about.

New Telephone Numbers

A new switchboard comes into operation at Quadrant House on Monday, February 24th. As a result, the exchange number for most *Television* telephone lines will change from 661 to 652. The numbers on the left have been amended accordingly. This issue is due to be published on Wednesday, February 19th however. Should you need to call us during the period 19-21st, please use the old exchange number 661.

Continuity Tester/Low-R Ohmmeter

Ian Rees

While the majority of multimeters are excellent in most respects they are often poor when it comes to measuring low resistances. The instrument described in this article was specifically designed for checking tracks on broken PCBs, measuring from 0.1 to 100Ω in a single range. It has proved to be useful in many other applications where unambiguous continuity readings are required, for example with microwave ovens. As the test voltage is only 300mV, erroneous readings due to the presence of semiconductor junctions are avoided.

An audible tone can be switched in to allow track tracing to be carried out on fine print without the need to glance at the scale – the tone frequency drops as the resistance falls.

Very sharp probes are used to break through the print resist lacquer.

Principle of Operation

Fig. 1 shows the principle used. A constant-current source supplies 30mA to 10Ω resistor. Thus the probes receive a

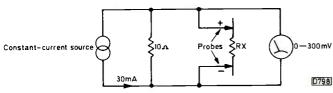


Fig. 1: Equivalent circuit to show the principle.

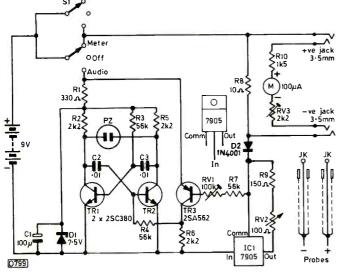


Fig. 2: Circuit diagram of the low-range ohmmeter.

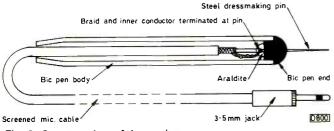


Fig. 3: Construction of the probes.

300 mV supply. Monitoring is carried out by a d.c. voltmeter that's scaled 0-300 mV and is connected in parallel with the probes and the unknown resistance RX. Since the unknown resistance RX is in parallel with the 10Ω resistor, the drop in voltage when the probes are connected to it is indicated by the meter, which is directly calibrated in ohms. The following simple formula enables the scale to be derived:

$$[(10 \times RX)/(10 + RX)] \times 0.03.$$

Circuit Description

Fig. 2 shows the complete circuit of the unit. IC1 is the constant-current source for the 10Ω resistor R8. RV2 sets the correct current of 30mA, which is registered as a full-scale deflection on the meter M. A $100\mu\text{A}$ meter is used, with the series resistors R10 and RV3 providing adjustment for 0.3V f.s.d.

Transistors TR1 and TR2 form an astable multivibrator which drives the piezo sounder PZ to provide the audio tone. TR3 monitors the voltage across R8 and D2. Since TR2's base bias is obtained from the collector of TR3, any changes in the voltage across R8/D2 are amplified and used to alter the tone produced by the oscillator. RV1 adjusts the basic tone. D1 stabilises the supply to the oscillator, whose frequency would otherwise vary with battery voltage. A three-position switch, S1, enables the meter to be used with or without the audio tone, which can be a bit wearing on the ear.

Probes

A problem with using a conventional multimeter to measure low resistance is that the test leads have an appreciable resistance which is in series with the item being tested. With this meter the voltage at the very tip of the probes is monitored. The supply to the item being tested is applied from the jack socket via the braid of a screened lead, the lead's inner conductor, which is terminated directly only at the probe tip, being connected to the meter.

Construction of the probes is shown in Fig. 3. The following items are required to make them: a red Bic type disposable pen; a black Bic type disposable pen; two steel (not stainless) dressmaking pins; two 1m lengths of a.f. screened cable; two 3.5mm jack plugs.

Bare the inner and outer conductors of the screened cable, twist together at one end only and solder to just below the head of the pin (active flux makes this easy).

Dispose of the pen innards, keeping the bodies and caps. Remove the pen's small end cap and pierce the pin through, making sure that it's central. Feed the screened lead through the body of the pen. With the head of the pin pushed firmly into the end cap, apply a small amount of Araldite adhesive to retain the pin and prevent pressure on the tip forcing it back. Slide the end cap back into the body of the pen. Solder the inner conductor and outer braid to their respective terminals on the 3-5mm jack, being careful that they aren't shorted inside.

MANOR SUPPLIES

FOR DOMESTIC TV & VCR.

TEST DEMONSTRATIONS AT 172 WEST END LANE





- ★ 40 different patterns and variations.
- ★ Fully interlaced sync pulses with correct picture blanking
- EBU colour bars, BBC colour bars, whole rasters & split bars (specially useful for VCR service), white, yellow, cyan, green, magenta, red, blue and black
- Chequerboard
- Mono outputs with border castellations, cross hatch, grey scale, vertical lines, horizontal lines and dots. UHF modulator output plugs straight into receiver aerial socket.
- Additional video output for CCTV & VCR.
- Facilities for sound output.
- Easy to build kit, standard parts. Only 2 adjustments. No special test equipment required.
- Mains operated with stabilised power supply.
- All kits fully guaranteed with back-up service.
- Also available with VHF Modulator.

Price of Kit	£75.00
Case $(10'' \times 6'' \times 2^{1/4}'')$ app	£15.00
Optional Sound Module (6MHz or 5.5MHz)	£3.90
Built & Tested in Case including Sound Module	£122.00
Post/Packing £4.50	
Add VAT 17.5% TO ALL PRICES	

PAL COLOUR BAR GENERATOR (Mk4)

- ★ Output at UHF, applied to receiver aerial socket.
- In addition to colour bars R-Y, B-Y etc.
- Cross-hatch, grey scale, peak white and black level.
- Push button controls, battery or mains operated.
- Simple design, only five i.c.s on colour bar P.C.B.
- Backup service available.

PRICE OF MK4 COLOUR BAR GENERATOR KIT £35.00. CASE £5.80. BATT HOLDERS £4.20

MAINS SUPPLY KIT £5.80 (Combined P&P £4.50)

VHF MODULATOR (CH 1 to 4) FOR OVERSEAS £6.80.

EASILY ADAPTED FOR VIDEO OUTPUT & C.C.T.V.

ADD VAT 17.5%

ADD VAT 17.5%

LINE OUTPUT TRANSFORMER TESTER



- ★ Saves time and money.
- Checks short turns,
- Simple to use
- Reliable.
- Battery operated.
- ★ Pocket size.

PRICE £20.00

POST/PACKING £2.50

KITS AND PROJECTS

SAW IF AND TUNER UNIT complete and tested for video & audio outputs £28.50 p.p. £1.80.

PAL DECODER KIT (Video to RGB) for Monitors £27.00 p.p. £1.80.

PAL ENCODER KIT (RGB to Video) £18.50 p.p. £1.80.

CRT TESTER & REACTIVATOR KIT For Colour & Mono complete with Case, Panel Meter Indicator - can be adapted for latest CRTs £40.00 p.p. £4.50.

TV & VIDEO SPARES

TELETEXT PANELS

C2285, C2287, Text Conversion Kit £15.00

MULLARD VM6103 £10.00 POST PACKING FOR ABOVE £2.50

PHILIPS SPARES

GII 6 POS touch tune channel selector (replaces old type) £14.00 p.p. £1.80 MANUALS 2B. CPM £3.50. CTX-E. CTX-S. CF1 £2.50. KT4. K40, 3A £4.50 2A £10.50. KT3 £12.00 p.p. MANUALS £1.80 BACK UP BATT. 2.4V £3.80. L2V £2.60 p.p. 90p. K30, KT4, CTX-EHT Lead £4.90 p.p. £1.00.

THORN/FERGUSON SPARES

PHORN/FERGUSON SPARES

9080 Series IF/Decoder tested £10.00 p.p. £2.80.

TX10 Focus control £8.50 p.p. £1.80.

TX9/10 Remote & tuning 1515N £5.00 p.p. £1.80.

TX9/10 Remote & tuning 1536 (incl. SAA5012) £2.50 p.p. £1.80.

TX9/10 Remote & tuning 1536 (incl. SAA5012, \$2.50 p.p. £1.80.

TX10 Stereo Audio Board £3.50 p.p. £2.50.

TX90 Mains TX £23.00 p.p. £2.80.

TX100 Chopper TX £22.80 p.p. £2.50.

TX90 14" Chassis Untested complete £20.00 p.p. £4.50.

IC SELECTION

AN5521	£3.80	SAA5050	£11.80	TA 7698P	£6.80	TDA2593	£1.50	TDA4502A	£13.50
AN590	£2.20	SAA5231	£5.80	TBA120	£1.20	TDA2594	£3.80	TDA4503	£5.80
BA6238A	£2.80	SAB3035	£6.80	TBA750	€2.20	TDA2595	£4.80	TD 44505	£6.80
CNX62	£4.80	SAB3037	£15.80	TBA920	£2.80	TDA2600	€6.80	TD4555	£9.80
FRG07	£7.20	SAF1032	£4.50	TBA950	£2.20	TDA2611A	£1.90	TDA4600	£3.85
HA11211	£2.80	SAF 1039	£2.20	TCA270	£1.80	TDA2640	£3.20	TDA4601	£2.80
HA11423	£2.10	St 470 471	£4.00	TCASO	£6.80	TDA2653A	£3.20	TDA4610	£6.80
HA513385P		SI 486	€3.20	TDA1035T	£2.40	TDA2654	£5.70	TDA5510	£5.80
LA4445	£3.00	SL 490	£3.80	TDA 1037	£1.90	TDA2655B	£8.60	TDA5850	£2.80
LA7800	£1.80	SL1430	£1.80	TDA 1044	£2.90	TDA2670	£3.20	TDA8153	€7.80
LA7520	£2.80	SL 1432	£1.40	TDA1060	£3.80	TDA2680	£3.80	TDA8180	£6.80
LA7801	£3.50	SN76226DN		TDA 1082	£4.80	TDA2690	£3.80	TDA8190	£3.80
LA7830	£2.80	SN76705	£9.80	TDA1170	£2.20	TDA2780	£6.80	TDA9403	£3.80
M293B1	£7.80	STK5325	£6.80	TDA1180	€2.20	TDA3190	£4.20	TDA9503	£3.80
M490BB1	£14.80	STK5332	£6.80	TDA1190Z	€2.20	TDA3300	£6.80	TDA9513	£4.80
M491BB1	£9.80	STK5333	£18.40	TDA1432P	£5.70	TDA3301	£7.50	TLAIDD9	£2.20
M494	£9.80	STK5338	£6.80	TDA1470	£2.80	TD 43330	£6.80	TEA 1014	£3.50
MC13002P	£5.80	STK 5339	£6.80	TDA 1524	£6.80	TDA3500	£6.80	TEA 1039	£1.80
MDA2061	£7.80	STK5421	£6.80	TDA1670A	£3.20	TDA3505	£4.50	TEA2018A	£2.20
MDA2062	£3.80	STK5422	£8.50	TDA1701	£3.80	TDA3510	£9.80	TEA2165A	£6.80
ML237	£3.80	STK5471	£6.50	TDA 1770	£3.20	TD A 3540	£2.50	TMS1000N2	
ML926	£4.80	STK5481	£5,80	TDA 1870	£6.80	TDA3541	£3.50		£3.80
MN15425	£15.80	STK5482	£5.80	TDAIS	£2.80	TDA3561A	£5,80	IMP47C432	
SAA1024	£5.80	STK7308	£6.80	TDA 1940	£3.20	TDA3562A	£5.80	8189	£13.50
SAA 1025	£5.80	STK7348	£10.80	TDA1950	£3.50	TDA3565	£3.80	TMP47C434	
SAA1124	£3.50	STR441	€7.80	TDA2040	£7.80	TDA3566	£5.80		£16.80
SAA1250	€3.80	STR450	£6.80	TDA2150	£3.20	TDA3571	€2,80	TMP47C434	
SAA 1251	£8.40	STR451	£7.80	TDA2270	£2.80	TDA3576	£13.50		£15.80
SAA 1292	£13.20	STR454	£5.80	TDA2510	€6.80	TDA3640	£5.20	TUA2000	£8.50
SAA1293.02		STR4211	£6.80	TDA2548	£5.80	TDA3650	£9.80	UC3844N	£4.95
SAA3027	£5.80	STR5412	£6.80	TDA2576A	£3.80	TDA3651	£4.20	UPC 1378	£1.90
SAA5000	£2.80	STR50103	£5.80	TDA2577	£4.80	TDA 3653A	£3.80	UPC 1394	13.80
SAA5010	£5.80	STR54041	£10.80	TDA2577A	14.80	TDA3653B	£3.20	UPC1420	£8.60
SAA5012	£5.80	STR58041	£6.80	TDA2578	€3.80	TDA3654	€3.20	UPC1488	£3.20
SAA5020	£5.80	STR6020	£5.80	TDA2579	£3.80	TDA4442	£6.80		- 1
SAA5030	£6.80	TA7680AP	€5.80	TDA2581	£2.20	TDA4500	£5.80	E p.p. 90p	
SAA5040	£6.80	TA7681P	£5.80	TDA2582	£2.80	TDA4501	£7.80		

VARICAP TUNERS: Grundig 8630 series £5.50 p.p. £1.00. U321. U322/U341/N. ELC1043 (equiv). SC4, VHF NSF203 £7.80 p.p. £1.80. UHF/VHF UV411 £10.80, U343 £10.80 p.p. £1.00

LINE OUTPUT TRANSFORMERS p.p. £1.80

DECCA 100 FIDELITY ZX2000, CTV140.	£10.80	PHILIPS G9	£8.80
FIDELITY ZX2000, CTV140.	£15.50	PHILIPS KT3	£13.80
FIDELITY ZX3000	£14 S0	PHILIPS K30	£31.80
HINARI CT4, CT5	£24.80	PHILIPS CTX-E. S	£27.50
HITACHI CPT1455, 1456, 1476, 1491	£28.80	PHILIPS KT4	£22.40
HITACHI CPT2174/76/78.	£28.80	PHILIPS 2A	£25.80
HITACHI P/N2433752		PHILIPS K40	£27.50
ITT Compact B 110		PHILIPS 3A, 2B	£23.80
ITT Compact 80, 110	£17.80	PHILIPS (T-)	£32.80
ITT Compact 80, 90°	£22.80	PHILIPS CP90	£28.50
ITT Compact 80, 110° FST	£19.80	PHILIPS CP110	€24.25
FTT CVC 20. FTT CVC 25, 30, 32	£9.80	PHILIPS GRIAX	£25.90
ITT CVC 25, 30, 32	£10.80	PHILIPS NC3	£22.50
ITT CVC45	£9.80	SAISHO MATSUL 3714002	£21,80
ITT CVC 800, 801, 803.	£24.00	SANYO CTP7132, 80P Chassis	€39.80
17T CVC1100, 1206, Picos	£18.50	SONY KV 1882	£34.50
PTT CVC1150, 1175	£22.80	SONY KV 20926	£34.50
ITT CVC1200, 1201, Mini 2.	£18.50	SONY KV 2704	660 00
ITT CVCI204	£11.50	THORN 1590, 91, 1612, 13, 1712	£4.80
ITT CVC1210/12/15/17	£17.80	THORN 1690, 1691	
ITT Digi 3. 110°	£19.80	THORN 9000	€9.80
ITT Core 110°, 90° ITT Core 110° FST	£19.80	THORN 9600	£9.80
ITT Core 110° FST	£19.95	THORN ICCS	£21.00
ITT TX3326/7	£22.80	THORN TX10 (Chopper) THORN TX85	£16.50
ITT TX3446	£22.80	THORN TX85	£19.80
ITT Monoprint A	£21.80	THORN TX90 14"	£19.80
ITT Core 110" FST	£19.95	THORN TX90 20"	£21.840
LOEWE - Classic M124, M27	£33.00	THORN TX100, 110° Green Spot	£19.80
LOEWE - Contur M27	£33.00	THORN TX100 90 1-ST Yellow Street	£21 80
LOEWE - Other (Quote model No.)	£21,80	THORN TX100HST T6045L	£25.50
PHILIPS 320	£2.80	POST PACKING LOPT'S	

DEGAUSSING ROD £33.75 p.p. £2.80 TRANSPARENT SERVICE CASSETTE £6.80 p.p. £1.80

HOW TO ORDER: ADD p&p TO ORDER + VAT 17.5% TO THE TOTAL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE



Telephone 071-794 8751, 794 7346 Fax 071-431 5778



MANOR SUPPLIES 172 WEST END LANE, LONDON NW6 1SD Use the pen caps to prevent damage to the probe tips when not in use. I use similar probes with my multimeter when testing oxidised connections etc.

Construction and Setting Up

The circuit was built on a piece of matrix board fitted to the meter's terminals. Layout is not critical.

After building the ohmmeter, turn RV2 to the maximum resistance position and connect a known accurate voltmeter to the probes. Adjust RV2 for a voltmeter reading of 300mV, then set RV3 for full-scale deflection on the internal meter M.

Mark the meter's scale with a fine fibre pen, using the following table:

Scale (V)	Resistance RX (Ω)
0.014	0.5
0.027	1
0.050	2
0.100	5
0.015	10
0.018	15
0.214	25
0.250	50
0.273	100

Teletopics

APPLE GOES FOR THE CONSUMER MARKET

Apple Computer sees domestic electronics as the key to expanding its business, through innovative new items that link personal computer technology with products for consumer use. As mentioned last month, Apple is developing a "multimedia device" with Sony. John Sculley, Apple's chairman and chief executive, in giving the keynote address at the January Las Vegas Consumer Electronics Show mentioned a number of likely products, some of which will be released in the USA in time for next Christmas. These will include what Apple refers to as Personal Digital Assistant (PDA) products - personal organisers if you like - which are hand-held computer devices that can extract information from large databases and communicate with one another. There will be new, simpler versions of the Macintosh PC with built-in CD players, offering video, sound, graphics and text. Other likely products include electronic books, videophones, players interactive multimedia communicators. One aim is to exploit the possibilities of Apple-created software now that the professional PC market is nearing saturation point. Apple has been holding talks with various companies active in the consumer electronics field and expects the future products to sell under various brand names.

LAUNCH PLANS

Philips has released details of its launch plan for the digital compact cassette (DCC) system. A public awareness programme is to start in April, when the first DCC players (Model DCC900) will be available for demonstration and review purposes. This will be followed by a pre-launch phase from June-August, when prerecorded software will become available. Release of the players in quantity is to start in September. Philips hopes that a library of some five hundred prerecorded cassettes will be available by then. The first domestic players will probably be released in the USA, at a price equivalent to around £390. Within a year there should be DCC midi systems, personal stereos and in-car versions.

Philips had originally hoped for a full launch in the spring, but getting the production technology right has led to delays. In particular production of the thin-film heads has been a problem.

Philips Car Stereo International and the Japanese company Alpine Electronics have reached an agreement in

principle for the development of in-car DCC products. It's hoped that the first car DCC/radio units will be available next year.

Sony plans to launch its mini disc (MD) system at around the same time as the DCC system, this autumn. The autumn will also see the start of prerecorded MD production at the DADC (digital audio disc centre) in Austria. Initial production capacity will be 1.5 million discs a month.

PHOTO-CD FORMAT EXTENDED

Kodak and Philips have announced changes to the Photo-CD format which was initially envisaged as a means of storing photographs on compact discs. By altering the file format up to 72 minutes of sound can be added, the graphics and text can be improved, extra interactivity is introduced and more pictures, with sound, can be stored. The original format specified storage of up to a hundred 35mm photographs. Introduction of a TV resolution mode will enable up to 800 images, with sound, to be stored. The first Photo-CD players will incorporate these extra capabilities and are expected to sell at around £350. Launch in Europe is due this summer, when Philips expects that a catalogue of prerecorded Photo-CD titles (sports, art, nature etc.) will be available. The discs will be compatible with audio CD, CD-I, CD-ROM and Photo-CD players.

BROADCASTING NEWS

The Independent Television Commission has decided to postpone advertising the fifth TV channel franchise and has altered the terms. The licence was originally to be advertised in January, but the ITC has decided that more work needs to be done on the proposals for interference reduction (VCR retuning etc.) and how this is to be tackled in practice. It seems that the advertisements will now appear in March or April. The channel operator will no longer have to pay to the treasury five per cent of net advertising revenue in addition to the annual franchise fee, and the time for completing the network has been extended. The original plan was that broadcasting to at least forty per cent of the population should begin no later than December 1994, rising to sixty five per cent by the end of the fifth year. This has been reduced to thirty per cent rising to fifty five per cent. Requirements on other factors, including the level of original programming, have also been eased. The ITC is clearly concerned about attracting suitable bids and the technical problems, some of which have been aired in these pages recently.

The ITC received five applications to run the Channel 3/4 teletext service. These were from Intelfax Ltd. and

Carlton Communications plc.; Oracle Teletext Ltd.; Teletext UK Ltd.; TV-am Cable Television Ltd.; and Update Telextext Ltd.

VIDEO NEWS

JVC has introduced an S-VHS VCR with 16:9 widescreen capability. Model HR-S4700EK has a full specification including hi-fi stereo sound, a Nicam decoder, automatic head cleaning, Fastext compatibility (with an optional teletext decoder), a 48-channel tuner, a one-year/eight-event timer, an express-start mechanism that goes from stop to play in 0.3sec and a built-in video processor that offers five picture modes. AV sockets include two S terminals, twin Scart connectors (one input/output, one input only) plus an r.f. and phono audio sockets. The suggested price is £700.

JVC claims that the use of a twin-path detail enhancer. which is a non-linear emphasis system, improves the quality of the S-VHS pictures. The HR-S4700EK also has a video noise reduction circuit that uses a new signal transform theory. It's claimed that this reduces picture noise when there are subtle changes of light. A dynamic double limiter is used to prevent over-modulation. Widescreen pictures from several sources, including the future PAL Plus, D2-MAC and HD-MAC transmissions and camcorders with 16:9 video software, can be recorded. The widescreen system works via a Scart socket. When a widescreen signal source sends a 5V switching signal to pin 8 the machine automatically labels the tape with a widescreen ID code; during playback the switching voltage is sent from the VCR to the TV set which then adjusts for 16:9 pictures. Users can select the widescreen mode manually when the signal source is not accompanied by a switching signal. The widescreen ID code is a modification to the VISS (VHS index search system) coding.

Fuji's recently introduced 8mm palmcorder, Model FF60 Wide, with a suggested price of £729, scores in having a wide-angle lens system for improved indoor recording. For this purpose a slip-across wide-angle converter lens is incorporated. In use the adaptor changes the lens's normal 7-42mm zoom range to 4.9-29.4mm, effectively extending the zoom range from ×7 to ×8.6. Amongst the camcorder's many features are IR remote control, a detachable pistol grip that doubles as a table-top tripod, LP/SP operation, interval/time-lapsed recording, a self timer and an eight-colour, one-page title grabber with three-way scrolling. Relevant features are also common to Fuji's first Hi8 palmcorder, Model FH80.

Commodore introduced a number of additions to its CDTV system at the Las Vegas Consumer Electronics Show. Peripherals include a keyboard, two-button mouse, floppy disc drive, trackball controller, video genlock and personal memory cards (64K and 256K). There are facilities to expand a CDTV player into an Amiga computer and a CD-ROM drive that gives Amiga users CDTV/CD-ROM/audio CD capability.

The UK video rental market has been in slight decline over the past three years, falling from a peak of £569m in 1989 to £564m in 1990 and £544m in 1991. Tape sales are still increasing however, having risen to £375m in 1991.

SATELLITE TV

Dish installations have continued to increase, the December figure issued by the *Financial Times* satellite TV monitor being 116,000, bringing the total number of installations at the end of 1991 to some 2.13m. It's

expected that a further million plus dishes will be installed this year. This recent growth and an increase in subscriptions mean that BSkyB is on the point of reaching profitability at the operating level, i.e. before taking interest costs into account. Subscriptions produce eighty per cent of BSkyB's income.

Siemens has developed a range of i.c.s for satellite TV receivers. The SDA6102X PLL tuner features fast locking after channel change; f.m. demodulation in the 300-900MHz range is handled by the TDA6140X; video processing (PAL/MAC/D-MAC) is carried out by the TDA6151X; while the TDA6160X is a three-channel sound processor. The TDA5664X modulator can be used to provide an r.f. output. Future developments will include a first i.f. (950MHz-1.75GHz) mixer/oscillator chip and a version of the f.m. demodulator chip with threshold extension and digital a.f.c.

VIDEOPHONES

American Telephone and Telegraph has introduced in the USA what is claimed to be the first mass-market videotelephone that can be used with existing phone lines to provide full-colour, moving images of the caller. The image is in slow motion – variable between two and ten frames per second – and is not synchronised with the speech. During trials, users reported that these limitations were acceptable for personal calls. The VideoPhone 2500 will go on sale in May at \$1,500 (about £840) and will also be available on rent. There's no extra cost for calls. The phone has a 3.3in. fold-up LCD screen and a camera lens with shutter. A European launch is expected next year.

Amstrad is due to demonstrate a videophone that works with existing phone lines this month (February). The company, working with GEC Marconi, aims to produce phones to sell at under £500. Other companies are developing videophones for the consumer market.

MISCELLANY

B-Tech Ltd., Units 10 and 11, Meridian Centre, Vulcan Way, New Addington, Croydon, Surrey CR0 9UG (0689) 848 535, fax 0689 841 087) has introduced a three-way Scart video control unit. It has three Scart input sockets, each independently switched, and a single Scart output socket which is supplemented by two phono sockets for a stereo sound output. Connections can be made to three VCRs, a satellite TV receiver plus two VCRs or a computer plus two VCRs for example and the monitoring TV set. Two sets of push-button switches enable the input to the TV set and the signal source for recording to be selected. The system enables you to record from satellite TV or another VCR while watching a different programme, the phono audio output sockets providing a link with a hi-fi system. The unit is supplied in a blister pack and has a recommended retail price of £39.95.

The National Vintage Communications Fair 1992 is to be held at the Pavilions Hall, the National Exhibition Centre, Birmingham from 11 a.m. to 5 p.m. on Sunday May 3rd. There will be stalls and demonstrations of historic equipment, including a Baird Televisor (30-line mechanical TV) and a working 1936 Marconiphone TV set. It's intended that the Fair should act as an information exchange for collectors. Details can be obtained from Jonathan Hill, 2-4 Brook Street, Bampton, Devon EX16 9LY (0398 331 532). Admission will be £2 (£1 for children aged 14 and under).

Automatic Windings, Unit 40, Woolsbridge Industrial

Estate, Three Legged Cross, Wimborne, Dorset BH21 6SZ (0202 826 888) has developed a material that can be injection moulded to make inductor cores. The new material, a soft ferrite/nylon combination, has the added advantage of having a distributed air gap as part of the finished moulding. It's also a low-loss material, as required in many power supplies. Injection moulding is less expensive than the pressing and sintering processes normally used in making cores. The new material is moulded into shaped discs, two of which form a pair or bobbin into which wire can be wound to complete an inductor. The new design enables engineers to make prototype inductors from kits rather than being forced to use the off-the-shelf product that comes closest to their needs. The process is so simple that multiple inductor arrays can be wound by hand. Automatic Windings has self-assembly kits available for use by design engineers.

Sharp has developed a 16.5in. LCD screen for use in colour portables or personal computers. It has 1.2m pixels and uses thin-film transistor technology, with three transistors for each pixel to control the RGB light output.

Philips Components Ltd., Mullard House, Torrington Place, London WC1E 7HD has introduced a multilayer line output transformer designed to meet the high brightness requirements of the latest large-screen TV sets,

including high-definition and 16:9 aspect ratio models. The AT2091 can generate e.h.t. voltages up to 35kV at power levels as high as 60W, has integral focus and first anode supply potentiometers and is suitable for operation at up to 64kHz. As it uses the Japanese style 12-pin horseshoe pinning it's interchangeable with several types of flyback transformer produced in the Far East. Multilayer construction has several advantages over the conventional slot system. These include increased reliability, while if the transformer does fail it tends to cause less damage to the set. An additional feature of the AT2091 is the lack of high-voltage a.c. on the PCB side of the transformer. This reduces corona discharge, resulting in less stress on associated components and less build up of contamination on the board.

This year's Ferguson trade show is being held at Alexandra Palace. It will feature the new B86W 36in. widescreen model with an HDTV compatible, 1,250-line chassis. Other recent models from Ferguson include two 15in. FST colour portables, the A36R and A36F. The latter has Fastext. Prices are £230 and £250 respectively.

Bath-based satellite TV equipment distributor Longreach Ltd. has opened a London depot at Unit 13, Stirling Industrial Centre, Stirling Way, Borehamwood, Herts WD6 2AN (081-953 6116, fax 081-207 0430).

What a Life!

Donald Bullock

The other day I answered a knock on the workshop door to find Greeneyes entertaining a cove who looked like the Pied Piper in a scarecrow outfit. I took an instant dislike to him – perhaps because he was carrying a Fidelity CTV14S colour portable.

"This is Mr. Flighty" she said. "He wants you to look at his set."

"Thought you'd be a younger man" he said, surveying me. I gave him a look and he minced off.

The Dead Fidelity

With his set on the bench and the back removed I saw that the 2A mains fuse had died violently. A check on the BU508A chopper transistor TR13 showed that it was dead short. So I replaced both items and tried again. The new fuse immediately departed this life. Further checks were clearly needed. It didn't take long to find that one of the bridge rectifier diodes, D19, had reverse leakage. When this had been replaced and another fuse had been fitted the set came to life. I put it on soak test.

A Monochrome Portable

A smart chariot then pulled into the drive. Its owner had long legs and long blond hair – also a Ferguson 3845 monochrome portable (1690 chassis).

"Is your son, the television engineer, in? I want this set mended."

"Just leave it with me" I said. "I'll see that it's done. Name and address please."

On investigation the set was dead with only 2.4V at the 2A fuse in the feed to the series regulator transistor. Full of prejudice, I peered nastily at the T6006V line output transistor VT17. An in situ measurement gave a base-

emitter short-circuit reading. It's difficult to get the transistor out, so I consulted the circuit diagram to see whether there was a reason for this reading. There is. The emitter is earthed and the base goes to earth via the secondary winding on the driver transformer. Furthermore there's an efficiency diode connected across the transistor. So for a certain check it had to come out. This proved that it was all right. So was the diode. Other checks were made, but no shorts could be found.

I decided to adopt a different approach and went back to the supply source. This took me to the battery input socket. Was it I wondered open-circuiting the input to the regulator? Shorting across tags 31-2 would prove the point, and when I did this the set sprang to life. A replacement socket put matters right.

As I put it all together again I glanced at myself in the bench mirror. I looked ever so young. What was getting into people?

Uncontrollable Brightness

Suddenly the picture on Flighty's Fidelity clicked off, leaving a brilliant screen. I checked the voltages around the TDA1365 colour decoder chip. They were way out. Since the chip had clearly failed, I wondered whether there was a particular reason for this, such as arcing in the line output stage. The transformer was corroded where the core projects from the windings. As I had a known good transformer I fitted it. Then, to make it easier, I slipped out the signals panel, replaced the TDA1365, refitted the panel and switched on. Would all now be well? No it wouldn't! In addition to uncontrollable brightness I now had no sound. After further tests I was no further forward and put the set to one side.

Stuck in Standby

The next set awaiting attention was a Panasonic TC2205 (U2 chassis) that was stuck in standby. I looked through the *Television* faults indexes and found a reference to the problem on page 745 of the August 1988 issue. Check

rectifier diodes D852-3 it said. The latter diode, a BY298, was very leaky. It provides the 25V supply. I fitted a replacement and got a purr of life, but there was no brightness. The BU208A line output transistor Q551 was short-circuit. A new one restored the set to full health.

Severe Patterning

Then the workshop door opened and a tubby little woman came in with a 20in. Triumph CTV8402 colour set.

"This set's faulty, I claim" she said, lifting her chin and

shutting her eyes as she spoke.

When she'd gone I switched the set on and plugged in an aerial. Up came a picture that was covered with severe herringbone patterning. The sound was perfect. I spent some time checking through the r.f. and i.f. sections to no avail, then recalled a similar fault I'd had with a Toshiba set. Looking through my home-made card index (I no longer rely on my memory) I found that the set had been a Toshiba C2020, which is identical to the Triumph receiver. I'd cleared the fault by replacing the $120\mu F$ electrolytic C807 in the power supply. Sure enough this worked again. Why hadn't I remembered it in the first place?

It wasn't long before Mrs. Tubby returned. She walked up to me, lifted her chin, shut her eyes and spoke. "It wasn't much, I claim" she said while fumbling for her purse. "This repair is guaranteed, I claim" she said as she

left.

A Toshiba V83B

I glanced at Mr. Flighty's Fidelity and quickly turned my attention to something else – a Toshiba V83B VCR. The ticket said it did what it liked. I inserted a tape and pressed the play button. Instead of a picture there was a screenful of thick, horizontal lines. Then I pressed the record button and got a screenful of mush and noise. Were there several faults or just one? I decided to start by replacing the TDA6360 processor chip IC50l. Fortunately this did the trick.

Dead Ferguson TX100

Heaving a sigh of relief, I glanced again at Flighty's Fidelity and quickly picked up a Ferguson 22G3 (TX100 chassis). It was dead, and when I checked through the TDA4600-2 chopper power supply circuit I found that the charging resistor Rll5, connected to pin 4 of the chip, had risen in value from $270k\Omega$ to $1.2M\Omega$. But a replacement failed to bring the set back to life. I next checked that the third pair of contacts on the mains on/off switch were providing the start-up pulse. They were. So I moved to the isolated part of the circuit and checked the 119V and 20V lines. Both were o.k. When I checked at the collector of the BC372 line driver transistor TR8 I found that the voltage was missing. The supply comes from the 15V regulator IC9. The voltages were o.k. here, but there was no voltage at either side of the feed resistor R143. Examination of the print between IC9 and Rl43 revealed an open-circuit. When this was repaired however there was still no voltage at the collector of TR8. I took it out and fitted a TIP110, which I prefer in this position. The set then came to life. For good measure I resoldered the joints around the line driver transformer T2.

Mr. Reever's Colour Portable

It was then that Mr. Reever brought in his Hitachi TELEVISION MARCH 1992

CPT1476 colour portable. "I've got a bit of trouble with it – keeps going off. It's done it again. Gumboils and Snoddies have had a go during the last six months. Reckon it's now your turn!"

When he'd departed I soon found that the STR4211 power chip, which had been replaced before, had failed. So had the BU508A line output transistor Q703. Replacing these two items restored normal operation. The set performed perfectly on soak test before Mr. Reever called and took it off.

Back to the Fidelity

Flushed with success, I decided to tackle Mr. Flighty's Fidelity again. Uncontrollable brightness and now no sound as well. If only I could go back to the start, when at least I had the sound.

Looking around the chassis for clues, I noticed that there was something odd about plug A and its socket on the signals board. While the female half, moulded on to a tencore ribbon cable, was clearly a ten-pin one the male half, part of the signals panel, had eleven pins. This meant that they could be connected together in either of two positions, and in one of these positions all ten connections would be wrongly made. I'd pressed them together so that from my viewpoint they fitted snugly and properly. What would happen if I parted them and reconnected them one pin along? When I did this a perfect picture, with sound, came up.

As I boxed the set up I thought about the possibility of ending up with a severely damaged set because of this. I remembered that I had a similar scrap set in the next room and fished it out so that I could see if the plugs and sockets were the same. They were both ten-pin types. I wonder whether anyone else has come across this production quirk?

Logik VR960A

A Logik VR960A VCR was soon dealt with. It was dead except that the display lit up. I checked the voltages at the STK5332 power supply chip and found that they were all haywire. A new chip restored normal operation.

Return of Mr. Reever

I was just thinking of calling it a day when the door opened and a disgruntled looking Mr. Reever bowled in with his Hitachi CPT1476. "You put a faulty part in this set" he announced. "It lasted only an hour."

I waved him out, put the set on the bench and plugged it in. Up came a perfect picture. Half an hour later it failed, and no amount of heating and freezing would bring the fault under control. I eventually resorted to minute examination of the panel through my giant magnifying glass, while probing about. None of the solder joints looked dry, but one or two were sitting in little circles of brittle looking flux. While scraping at one of these with a watchmaker's screwdriver it lifted away from the panel, though it remained perfectly soldered to the component leadout wire. The connection was to the cathode of D950. Closer examination showed that there was a film of grey dust between the panel and the solder blob. I cleaned off and resoldered the joint, then similarly treated a few other nearby joints just in case. After a soak test I pronounced the set fit.

"I hope it's all right this time" Mr. Reever said when he returned, looking at me straight in the eyes.

Servicing Philips DMP Series Decks

Philip Blundell, AMIEIE

The aim of this article is to provide insight into the problems commonly encountered with VCRs that use the Philips DMP/IDM series deck. Philips VCR models include the VR202, 203, 6180, 6182, 6185, 6285, 6290, 6291, 6362, 6367, 6390, 6467, 6468, 6470, 6561, 6760, 6761 and 6870. I've seen clones in the Pye, Pioneer, Tatung, Tashiko, GEC, B and O and Finlux ranges.

Information and Spares

A circuit description for the early models (VR6760) is available from Philips under part number 4822 726 14069. It gives an in-depth description of the electronics and the mechanics. When you order a manual for a Philips model you generally get the electronics and cabinet sections: if you need information on the mechanics you have to quote the deck type number. When ordering parts it's important to look at the label between the left-hand side of the lift and the lift guides. This will tell you the deck model and the production week. Deck types in this series are as follows:

DMP2/0. Deck has two video heads only.

DMP2/2. Deck has two video and two hi-fi audio heads.

DMP3/0. Deck has two video and one perfect still head.

DMP3/2. Two video, one perfect still and two hi-fi audio heads.

IDM2/0. Two video heads only.

IDM3/0. Two video and one perfect still head.

The WD number is the week code.

Certain parts, particularly those in the lift mechanism, have been modified – some three times! Fitting the wrong lift causes problems with the COD3 switch not closing or the cassette door opening too late to miss the cassette on its way out. The IDM decks have strengthened lift mechanics. Although they look similar to the DMP types, not many of the parts are interchangeable.

If any of the moulded parts have broken off the chassis, a new subassembly is available. The half chassis comes complete with rack, coupling, scanner ring etc. ready to accept the original video drum, drum motor and top plate. You'll need to set up the tape path – don't forget the back tension as the assembly comes with this set at minimum. The part number for the half deck is 4822 691 20465.

Deck Design

The mechanical design of the deck is unlike anything seen before. It was designed for automated production – even the tape path alignment was automated. The deck is very simple and robust.

The chassis consists of a steel plate with the two sides bent square. Moulded guides that control the cassette lift as it is raised or lowered are located in the sides. There are three motors. The drum motor is of the direct-drive type. The combined capstan and wind motor is called the combi motor. The control motor is for threading and lift operation. Deck position is sensed by three switches which Philips call code switches, or COD for short. Switch COD1 is on the left-hand side of the chassis: it senses eject mode and cassette inserted. Switch COD2 is at the rear, by the

head drum: it's closed several times during threading or unthreading. Switch COD3 senses when the lift is down. There are three mechanism states – eject, stop out (threaded out = wind/rewind) and stop in (threaded in = play, record, visual search). The microcomputer control chip monitors deck operation by sensing the inputs from the code switches, the tape beginning and end sensors, the control track output, head, capstan and take-up reel rotation and the presence of the record tab.

Figs. 1-3 illustrate various aspects of the deck.

Cassette Lift Operation

The following things should happen when the cassette lift is in operation. The cassette should slide easily into the lift, which shouldn't move forward (tripping switch COD1) until the cassette is against the stops. The threading motor is then energised, rotating the gearbox. The rack moves backwards, turning the lift lever and pulling the lift forwards and down.

As we all know however, customers can insert cassettes askew, put stickers in the wrong places and so on. As a result the lift can begin to move before the cassette is fully home. There is then a collision between the cassette and the pinch roller. This means damage to the pinch roller, the lift lever, the rack or all three. In later production the problem was solved by adding a mechanical catch to the lift: it's released only when the cassette is fully home. The parts required are available as spares, but not all chassis have holes drilled where the fixed part should fit.

Common Faults

Early racks (dated 1986) had a tendency to loose teeth. This causes a jam up, usually in the threaded position. Much used racks of any date tend to develop a wear ridge where the metal blocking lever rubs on the rack. As a result the rack jams, usually in transition from stop to eject.

A perished pinch roller is not uncommon. Problems with tape creasing, the tape path or varying sound volume could well be due to this. No visible signs of rubber cracking may

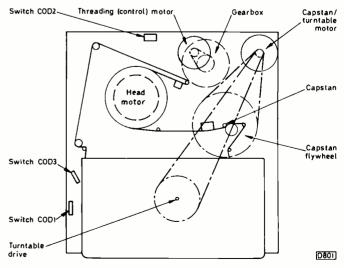


Fig. 1: Outline of the motor drive system.

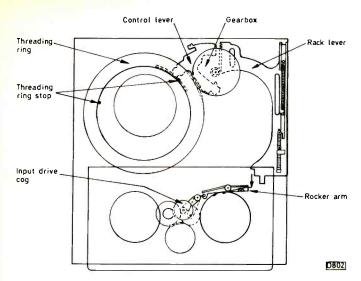


Fig. 2: Outline of the loading/threading system.

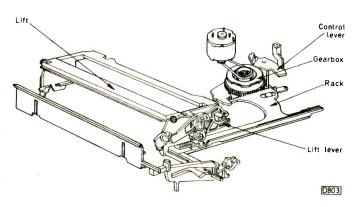


Fig. 3: The cassette lift mechanism.

be seen in the early stages of failure. One cause of a snapped off pinch roller has already been mentioned. Other things to check are that the flap opening lever operation is free and the tension of the return spring.

The wind/rewind coupling can cause problems in the search modes. The usual problems are noisy operation in reverse search or the tape suddenly becoming tight during search operation. The latter may dirty the heads or stall the drum.

If you need to dismantle the deck to replace any of these items, buy a service kit, part no. 4822 310 31803, and fit all the things it contains. It's cheaper to buy the kit than to buy any two of the previously mentioned items, and once the kit has been fitted all the main trouble spots will have been dealt with. The deck will be a lot quieter in operation because of the new gearbox and pulley design. The rack components have also been changed – so don't re-use any of the old parts.

Dismantling the Deck

The following deck dismantling description applies to Model VR6761. There are only minor differences with the other models.

To work on the deck the threading motor will have to be rotated. As access to the pully is difficult you can't turn the mechanism by hand as you would with say a Ferguson 3V30. Instead, power the motor by connecting a 9V battery or supply to it. Don't forget to disconnect the motor from the L293 drive chip, either by disconnecting one of the motor wires or unplugging connector L2 on

board P678, to prevent damage to the chip.

Remove the three screws that secure the chassis to the cabinet. Unplug and remove the erase oscillator PCB (if fitted). Very carefully remove the plug from the erase head – use too much force and you can break the head mounting. Unplug the other connectors, take off the cross bar (if fitted) and the cassette flap and remove the chassis from the cabinet.

Removing the Lift

Next lift removal. The lift should be in the raised position. The gears on the left are under spring tension which can be retained if the plastic catch on the right-hand side is used to lock the gear teeth first.

Carefully lever the left-hand side of the lift inwards so that the projection on the lift is disconnected from the COD1 switch cam. The lift is now free to be moved towards the flap, where there are holes in the gear track to allow it to come free. To retain the spring tension, lock the gear teeth with the catch provided. Raise the left-hand side of the lift free, then the right-hand side. If the spring tension is lost you'll have to turn the gear twenty turns anticlockwise looking from the right-hand side.

Removing the Top Plate

The deck has to be partly threaded before the top plate can be removed. Power the threading motor while the lift lever goes down and the threading ring moves the tape guide (next to the pinch roller) out of the way. Stop the motor when the pinch roller begins to move. Then reverse the motor so that the pinch roller is back where it started.

The five red screws can now be removed – there are two countersunk ones, two raised-head screws and one TORX 10 screw. Bend the head amplifier's wire bracket to the left, then disconnect the loading belt and the pinch roller's tension spring. The top plate can now be removed, bringing the pinch roller with it. Hold the pinch roller in place to make reassembly easier. With the top plate removed you have access to the rest of the mechanism.

Reel Idler and Rack Removal

Reel idler and rack removal. If the reel idler gear is unclipped it can be lifted clear. Remove the long spring between the two brakes and the connecting link that goes to the back-tension arm. Unclip the right-hand brake lever and raise the right-hand side of the brake bar. The latter can now be moved to the right, along the slot in the chassis, to where the slot widens. Then lift the bar clear. The coupling can now be lifted off the shaft. The latest type is made of blue plastic – earlier types were white or pink. To test the coupling, rotate the top and bottom gears clockwise and anticlockwise: the resistance should be similar in both directions. Reassemble the coupling and the brake assembly.

To change the rack, the belt pulley and gearbox will first have to be removed. In most models the pulley is held on by plastic clips that must be prised outwards before the pulley can be lifted up. The gearbox is not fixed: provided you've put the threading ring in the correct position the gearbox can be lifted off the shaft. On very early models the pulley was not fixed but the gearbox was – by means of a plastic split ring. In this case the gearbox must be dismantled in situ by unclipping the top cover to get to the retaining ring. Later models have the gearbox and pulley free on the shaft with no fixings. If there's a plastic washer

beneath the gearbox remove this as it's not required with the latest gearbox and pulley.

The rack teeth can now be seen. If the rack is lifted clear of the metal blocking lever it can be moved towards the rear of the chassis till the lift lever is vertical. The latter can now be carefully levered inwards so that it comes off the shaft. The rack is then free to be removed. The metal blocking lever and cover can be unclipped. Put the threading ring in the fully threaded position, then remove the spring under the deck. The control lever can now be prised up and removed.

Reassembly

Next, reassembly. The new parts in the kit can now be fitted. Put a small amount of grease in the control lever's groove. Make sure that the threading ring is in the fully threaded position, then fit the control lever in place. Turn the threading ring back to the dismantling position. Fit the spring under the deck, the metal blocking lever and the plastic cover. The original covers were white, later ones were grey while the latest ones are black. The racks are date coded, with the year in a circle. The replacement can be fitted without modification. There's one exception: some very early racks didn't have the raised triangular piece on the side. With these only, you need to break off the triangular piece on the new rack.

Rack and Lift Lever Timing

The timing of the rack and the lift levers needs some care. Put the rack on the plastic ridge, but don't at this stage fit it in place at the gearbox end. Offer up the lift lever, with it in the lift down position, so that the wedge-shaped tooth on the lever sits in the space between the spring-loaded bar and the rack's plastic teeth. Push the lift lever on to the shaft. Check the timing of the gears on the lift levers by moving the rack forwards and back. The lift levers should both move through their full travel. If the timing is wrong, the rack and the two levers won't move - so remove the lift lever and try again with it in a slightly different position. When this is satisfactory, press the rack into position next to the metal blocking lever and fit the rivet, gearbox and pulley. The gearbox will be easier to fit if the rack is moved to the right by hand to make more room for the gear teeth. Put the loading belt on to the plastic pulley.

Refitting the Top Plate

Now to refit the top plate. Fit the new capstan belt, clean the capstan and lodge the new pinch roller in place on the top plate. Offer up the top plate and fit the pinch roller on to the gear (the threading gear should have been left so that the pinch roller gear is in the starting position). To help when fitting the two gears together there's a hole in the top plate so that the gears can be seen. The gears are correctly timed when the pinch roller can be moved diagonally no more than 3-4mm relative to the top plate. If it moves more than this or not at all, try altering it one tooth then try again. Fit the left-hand countersunk screw loosely to hold the pinch roller in place. At the other end of the top plate, fit the tension spring into the hole in the control lever then, using a wire hook, pull the loading belt over the motor pulley. Bend the head amplifier's metal stay back into position and fit the rest of the red screws and the long belt under the deck.

Rotate the combi motor back and forth, checking that the brakes come on and spring off again. Lastly, turn the combi motor anticlockwise to move the back-tension arm out of the way of the moving tape guide as it returns. Power the threading motor so that the deck threads up fully, then unthread it and leave the deck in the eject position. If all is well so far the lift can now be replaced.

Refitting the Lift

Fit the right-hand side of the lift then the left, using the slots in the lift guides. Disconnect the catch from the gear while pushing the lift forward into the track. If a mechanical catch is fitted to the right-hand side of the lift this may have to be released to allow the lift to go far enough forward to enable the COD1 switch cam to be aligned with the lug on the lift. Check that the lift gears are parallel, with the same number of teeth showing at each side. Fit the cassette flap and spring, and plug the deck back in. Make sure that the cables are fitted into the plastic guides by the head drum, also that the wires to the erase head are out of the way of the tape in the play position. After fitting the deck retaining screws you should be ready for a trial run.

Dealing with a Jammed Deck

If the deck is jammed with the lift down you won't be able to dismantle it until the lift is raised. Remove the deck from the machine and look at the rear of the chassis. You'll see a slotted hole in the metal by the threading motor. Push the rack by pressing a small screwdriver through the slot: this will often release the rack, allowing the threading mechanism to turn. In difficult cases the metal blocking lever will have to be removed, though this means that the lift will be raised before unthreading is complete.

The Scanner Ring

As previously mentioned, if too much force is used when removing the erase head plug you can break off the erase head mounting. The bracket is part of the scanner ring – the plastic moulding on which the lower drum fits. If you remove the scanner ring be careful not to lose the spring beneath it. This spring raises the scanner ring off the chassis at one side, allowing the tilt of the lower drum to be adjusted when the tape path is being set up.

Lower Drum Earthing

As the lower drum is fitted on a plastic moulding it has to be separately earthed. This is done by means of a metal strap. Any problems that look like bad tracking could well be due to the lower drum not making good contract with this strap.

Service Mode

For several years now Philips VCRs have had a service mode in which, if there's a deck fault that causes the machine to stop, the front display produces an "error code" to show what the microcomputer control chip has sensed is wrong. With this range the error memory is battery backed so that the fault code is still present when the mains supply is interrupted (so long as the NiCad battery isn't flat of course...).

To call up the service mode in early models, with the video showing E-to-E press store and set clock at the same time. The channel number will go off, being replaced by the error code. The left-hand digit shows which mode the

machine was in when the fault occurred. This varies from model to model. With the VR6761 the code is as follows: 1 record; 2 play; 3 play +3; 4 rewind; 5 wind; 6 play -7; 7 play +7; 8 stop; 9 still; dark eject; C play -1.

The right-hand digit shows a number that indicates the fault, as follows: 1 loading/threading time too long; 2 capstan still; 3 head still; 4 right-hand reel not turning.

Only the last fault to occur is shown – a new fault overwrites any previous one.

On later models the reset button can be used to clear the memory, leaving it at 00. Early models are more difficult to clear. Put the machine into the service mode with a tape inserted, then press rewind or play. This puts the machine into continuous test: it plays a tape to the end, rewinds back to the start, then starts playing again automatically. As the error memory is cleared each time the machine starts to play from the start, if you switch to standby at this point the error memory is set to 00.

Newer models without a set-clock button on the front need the use of a remote control handset to get into the service mode. With these machines you press the remote control stop, then play on the VCR for four seconds or so.

I wish that Japanese manufacturers would incorporate a similar system. How many hours have you spent looking at decks waiting to find out what stops?

Some Mechanical Faults

For wow on sound, suspect a twisted capstan belt or a faulty capstan motor. The best way to check the motor is by substitution. If you don't have one to hand a rough check can be done by free-running the motor from a 9V supply. Connect a 10Ω , 5W resistor in series with the motor and use an oscilloscope to measure the voltage across this resistor. With no load a good motor will produce regular voltage peaks of around 0.5V p-p. A faulty motor will produce pulses of much larger amplitude.

If the cassette is ejected when play or one of the wind modes is selected, the machine probably thinks that the capstan isn't rotating. The capstan tacho signal could well be missing due to a crack by plug L2 on the small P678 PCB on the top plate. To prevent this happening, be gentle when removing plug L2.

If the machine shuffles the tray but won't come on to E-to-E it hasn't initialised properly. The usual cause of this is failure of the COD1 switch to open and close as the tray moves. In this case the service mode is of no help – as you cannot get E-to-E, the machine won't go into the service mode. Often however a visual check will show that the lift isn't connecting with the COD1 switch cam or the cam has fallen off.

Electronic Faults

As with most modern VCRs, electronic faults are comparatively rare. The VR6290 and VR6291 have a chopper power supply that had a tendency for the BUT11AF chopper transistor to blow if the mains plug arced or the mains supply was faulty. Fitting the SBC70l3 kit (part no. 4822 310 31817) should cure this if the power supply can has a red label. If the label is green the modification has already been carried out.

VR6870s can go dead with a clicking noise coming from the power supply. The culprit is usually C2011 (33 μ F) but to be sure I change all three of the small electrolytics on the stand-up panel.

In the earlier models (VR6362 etc.) C2329 (330 μ F) on the i.f. panel causes all sorts of trouble when it goes short-

circuit, depending on whether the overloaded supply switching transistors go open- or short-circuit. Likely faults are no test pattern, no E-to-E operation, a blank screen on play or being in record and play at the same time. This last one is tricky as it gives the impression that the video heads have failed though what's really happening is that the tape is being erased! Even more fun occurs if the engineer tries the faulty i.f. panel in another machine which fails in a different way...

Faults List

Finally, here's a list of various faults we've encountered:

No display or keyboard operation: No +13a supply as R3509 is open-circuit.

Ejects when play or wind is selected: No capstan tacho signal as R3509 is high-resistance or C2206 is short-circuit.

Head drum not rotating: T7113 open-circuit.

Bad playback dropouts: DOC offset control 3304 broken or lower drum not earthed.

Takes in cassette then ejects it again: Wire to switch COD3 broken.

Intermittent clock or keyboard stops working: Dry-joint on crystal 1001.

Take-up spool stops intermittently in play: Dry-joint on brake electromagnet.

Power supply output voltage varies: Check 6012, the optocoupler, 7001 and 7004 (Model VR6180).

Low or no power supply output: 7001 (BD436) open-circuit, D6006 or 2007 short-circuit or 1004 open-circuit.

Patterning on playback colour: Power supply screening plate missing.

No E-to-E colour: PB 10c supply still present but 7304 on board P306 leaky.

No record picture but sound o.k.: +12d supply missing. 7202 open-circuit.

No sound recorded (hi-fi models): Record level sliders at minimum!

Display shows wrong operation: Language option not set to English (later models only).

Smeary monochrome picture: Crack in track on on-screen display board by C2103 (Model VR6468).

Playback colour crosstalk: Faulty delay line 5102 (Model VR6180).

Microcomputer control chip crashes intermittently (timer or clock etc. stops intermittently): Check whether the 5V supply is low.

E-to-E fades off: U744 tuner (Model VR6185).

Smeary E-to-E picture: 7951 (4053) faulty (Model VR6362).

Intermittent failure of head to rotate: Change C2040 from 100nF to 10nF (VR6290 etc.).

Noise bar running through picture: Low control track signal due to internal leak at pin 13 of 7551.

Wow on sound: C2326 $(4.7\mu\text{F})$ open-circuit (Model VR6470).

BUT11AF chopper transistor keeps blowing: C2127 open-circuit (Model VR202).

Nokia's Approach to Widescreen TV

George Cole

Nokia recently demonstrated to the trade its new 16:9 widescreen TV set. Philips already has a widescreen set on the market and Thomson will be launching a Ferguson model this month (Feb.). The big surprise with the Nokia receiver is that it's a basic, 625/50Hz PAL model. The company has decided for the time being to leave aside 100Hz flicker-free operation, 1,250-line pictures and the D2-MAC system. As a result, the set will sell for around £1,000 less than the Philips model. A briefing was given by Nokia's marketing director David Silver and technical sales executive Paul England. David Silver began by outlining the present conditions in the UK's TV/video market. Around 65 per cent of UK homes have a VCR: 35 per cent have two or more. He presented some interesting figures, see Tables 1 and 2, relating to the European TV market in 1991. It's intriguing that 30 per cent of the sets sold in France have stereo sound circuitry despite the fact that there's no stereo TV service there. Large-screen sets (27in. and above) account for around six per cent of the UK market, while in Germany the figure is thirty per cent. Mr. Silver said that because of our bias towards smallscreen sets the UK was regarded by some as a "low-tech., Mickey Mouse market". With its new widescreen set, Nokia will be going for that six per cent large-screen section of the UK market. According to Mr. Silver this sector of the market has been growing steadily and has not been affected to any great extent by the recession. Nokia sees widescreen TV as being an extension of an existing market sector rather than a new market in itself.

Why make the new set a 625-line PAL model? Nokia thinks it best to separate the 16:9 and MAC developments. According to Nokia's market research, consumers welcome the prospect of widescreen TV. Thus Nokia feels that it's right to go for this market now rather than to wait for the MAC issue to be resolved. The company is not convinced about the benefits of 100Hz pictures, and points out that 1,250-line transmissions are not due until 1995. What's more, a true 1,250-line receiver would, according to Nokia, have to sell for around £5,000. Nokia's set doesn't incorporate a D2-MAC decoder because there are currently no D2-MAC broadcasts in the UK. Despite all this, Nokia's new set is "future proofed": there are three

Nokia's 36in. widescreen TV set which retails at £2,650.

input sockets that can be used for a D2-MAC decoder, a PAL Plus decoder or various audio and video sources.

Initial Models

The first widescreen TV model from Nokia is the 36in. Salora 36F8C, which has a price tag of £2,650. The company will start test marketing a series of widescreen sets under the Nokia brand name this spring. April should see the launch of the 9291 Cinescreen 625, a 36in. set, to be followed in May by the 32in. 8291, at a price of around £1,700, and a 28in. version in June, the 7291 at some £1.000-£1.200. These sets will all be fitted with Nokia's EuroDigi chassis rather than a new design, making them easier to service and cheaper to produce.

Nokia feels that widescreen pictures represent the biggest revolution in TV since colour, and points out that twenty per cent of BBC-2 and Channel 4 films are already broadcast in the widescreen, letterbox format.

The 36F8C incorporates an on-board stereo satellite receiver, a Videocrypt decoder (as a separate box) and an outdoor unit. There's a smart-card slot at the front of the set. Nokia says that the Videocrypt decoder is separate because Eurocrypt is the favoured EC system. Thus it's possible that Videocrypt users may eventually have to convert to Eurocrypt. Other features include the ability to expand letterbox and 4:3 pictures to fill the screen, a Nicam decoder, PAL/SECAM B, G, D, K, L, L' and I compatibility, one hundred programme memories and two

Table 1: European TV market 1991 - screen sizes.

Country			Scr	een siz	e (in.)		
•	14	15	16/17	20-22	24/25	27/29	<i>30+</i>
UK	39	6	3	28	18	5	1
France	26	7	4	31	16	14	2
Germany	22	3	6	26	13	29	1
Italy	26	8	11	19	18	16	2
Spain	44	4	4	21	17	9	1

Figures in columns are percentages.

Table 2: European TV market 1991 – features.

Country	Mono	Stereo	Non-text	Text
UK .	84	16	53	47
France	70	30	98	2
Germany	32	68	30	70
Italy	66	34	62	38
Spain	80	20	68	32

Figures in columns are percentages.

Table 3: Nokia's forecast UK large-screen TV market shares by value.

Screen (in.)	1992	1993	1994
21/22	37	33	31
24/25	42	43	39
28/29/33	18	17	16
16:9 format	3	· 7	14

Figures in columns are percentages.

hundred preprogrammed channels, Fastex, an on-screen menu system and picture effects. AV connections include three scart sockets (one full specification, the other two composite video and Y/C switchable), three phono inputs, external loudspeaker sockets, phono audio output sockets, a DIN subwoofer/booster amplifier output and headphone sockets. Though the sound system is more basic than that in Philips' widescreen set it includes two 20W music power amplifiers and six loudspeaker drive units. The 36F8C is 89cm wide, 65·2cm high and 58·7cm deep, weighing 70kg.

The Demonstration

A variety of sources, including a VHS VCR with the Nokia ASO plus picture enhancement system, satellite and terrestrial TV transmissions, were used during the demonstration. Much to my surprise there was little flicker, despite the 50Hz pictures. When a 4:3 broadcast is zoomed out, the top and bottom of the picture are chopped off. You don't really notice this unless you are

looking for it – or you're watching subtitles that disappear off the screen. To overcome the latter problem the set has a scrolling facility to lift the subtitles back on to the screen. When watching a conventional 4:3 picture there are black bands at each side of the screen. They can be used to display pictures from three external video sources, e.g. a security camera. Nokia calls this feature Picture Out of Picture (POP) - note that it can't be used to scan through the terrestrial channels. The set also has a picture-in-picture (PIP) feature.

TV-SAT now transmits regular 16:9 pictures, though the ones shown came from a VHS VCR. Incidentally a standard VHS deck can record 16:9 pictures but doesn't have an automatic switching system that detects whether the pictures are in the 4:3 or 16:9 format. The 36F8C's onscreen menu system enables you to select the correct display mode however.

Overall I was very impressed with what I saw and can't help feeling that Nokia could be on to a winner with its "keep it simple" approach to widescreen TV.

Long-distance Television

Roger Bunney

Though long-distance TV signals were received in the UK via all propagation modes, including F2, during December, reception overall was rather thin. Tropospheric propagation was active by December standards, the prolonged, stationary high-pressure system over Western Europe doing much to give good results. The collated Sporadic E log is as follows:

5/12/91 SVT (Sweden) ch. E3.

9/12/91 SVT E3; DR (Denmark) E3.

10/12/91 TVE (Spain) E2, 3.

14/12/91 DR E3; TVE E2, 3

15/12/91 TVE E2, 3, 4; TVE-2 E2; RAI (Italy) IA, B; MTV (Hungary) R1; CST (Czechoslovakia) R1.

21/12/91 DR E3.

22/12/91 SVT E3; DR E3.

23/12/91 TVE E2, 3, 4; DR E3.

24/12/91 NRK (Norway) E2.

25/12/91 SVT E2, 3; TVE E2.

26/12/91 TVE E3; DR E3.

28/12/91 DR E3.

1/ 1/92 RAIIA; SVT E2.

F2 layer propagation, though much reduced in comparison to previous months, produced a couple of surprises – and for once the 13th was lucky! On this day Simon Hamer at his home in North Wales logged STAR-TV ch. 0 (Australia, 46·172MHz), New Zealand ch. 1, RTM (Malaysia) ch. E2 (zero offset) and Thailand ch. E2 (–8kHz offset). The other opening occurred on the 21st, when Dubai and Iran ch. E2 and TSS-1 (Russia) ch. R1 were received.

There were several tropospheric openings, as follows:

5/12/91 French (TDF) and Swiss (+PTT) Band III/u.h.f. signals were received in the south/east.

7/12/91 More extensive reception in the south east from NRK

(Norway), SVT (Sweden), ARD (Germany) and DR/TV2 (Denmark).

14/12/91 An excellent opening with signals from ARD, ORF/ORF-2 (Austria) chs. E5, 8, 24 and 36, +PTT, CST chs. R10 and 36 – all received by Simon Hamer in North Wales.

23/12/91 +PTT received in the south.

25/12/91 TVE chs. E30, 31, 35, 37 and 39 received in the south west.

27/12/91 TVE chs. E7, 9, 21, 37, 45 and 48, TDF and the Benelux countries – reception once more by Simon Hamer.

28/12/91 Similar to the 27th.

1/1/92 West German Band III/u.h.f. stations received over much of the UK.

2/1/92 Similar to the 1st.

A quiet month then, but nevertheless a wide variety of signals to end a none too successful year. Let's hope that 1992 will be better! Our thanks to Tim Anderson (St. Leonards), Cyril Willis (King's Lynn), Roger Fussell (Torpoint), Mike Gaskin (Caterham), Simon Hamer (Powys) and Brian Williams (Cardiff) for sending in reception reports.

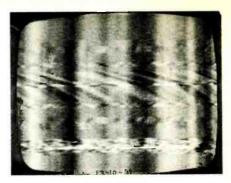
In an interesting letter Mike Gaskin (Gibraltar) says that because of growing interference problems in Bands II and III and congestion throughout the u.h.f. bands he's decided to concentrate on Band I exclusively. Impressive results are obtained using a two-element, wideband Trumatch aerial at a height of 31ft. Signal splitting is used to provide a feed for the popular AX700 scanner, a unique receiver with a panoramic display. Mike comments that the Geminids meteor shower over December 12-14th produced a lot of activity. This would seem to confirm that there's a link between MS and SpE propagation, as there was an intense SpE opening on the 15th. Mike is fortunate in having Band I clear: a mass of 49MHz baby alarms here at Romsey makes it impossible to see anything on ch. R1, the interference spreading down to ch. E2 and almost to ch. IA.

News Items

Czechoslovakia: The Czech and Slovak services have both been transmitting PAL coded signals on a test basis during programme hours. A change from the present SECAM to PAL could well occur in the near future. There has also been discussion about moving to the B/G transmission standard, i.e. with 5.5 instead of the 6.5MHz sound-vision







Left: Middle East Broadcasting test pattern, received via Eutelsat II F1 at 13°E. Frequency 11-554GHz, polarisation horizontal. Centre: Can anyone identify this Arabic ch. E3 signal, received by Ryn Muntjewerff in Holland on June 11th 1991 via SpE? Right: An example of classic F2 layer reception, again by Ryn, from Dubai ch. E2.

spacing of the present standard D, but it's felt that viewers would not be prepared to bear the cost of this in the near future. The new Czech Broadcasting Bill allows the start of commercial TV on a regional basis. Already NTV Praha, KF-Masseba TV and the Artepp company are seeking

channel allocations. It's likely that the new regional Czech broadcasters will share transmission facilities with the OK3/TA3 services. The franchises are to be awarded by June.

PHOTOSTATS SERVICE

Newer readers may have missed important servicing features published in *Television* over the past few years. We have therefore started a photostat service to make this information readily available. Photostats of the following servicing features, listed in alphabetical order, can be supplied at the prices shown. Please send requests to: Television Editorial Department, Room L323, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Cheques/POs should be made payable to Reed Business Publishing Ltd. There are two standard prices, see below.

Feature	Price
B and O L/LK2500/2800 chassis	Α
Decca 80/100 chassis	Α
Decca 120/130 chassis	Α
Ferguson FV31R VCR	Α
Ferguson TX10 chassis	Α
Ferguson TX100 chassis	Α
Finlux 1000 series chassis	Α
Fisher FVH-P520 VCR	Α
Mitsubishi CT2227	Α
Mitsubishi Euro-4 chassis	Α
Mitsubishi HS304 VCR	Α
Panasonic D1 VCR deck	A
Panasonic G VCR deck	В
Panasonic NV333/366 VCRs	Α
Panasonic NV370/830/850 VCRs	A
Panasonic NV730 VCR	Α
Panasonic NV777/788 VCRs	A
Panasonic NV2000/2010/3000 VCRs	A
Panasonic U3 chassis	A
Panasonic U4 chassis	A
Panasonic U5 chassis	A
Salora F chassis	A B
Salora G and H chassis	A
Salora J chassis	B
Salora K and L chassis	A
Sanyo CTP7130/1/2	B
Sony KV2252/2256/2752/2762	D

Sweden: Nordisk Television Ab, which owns the TV4 satellite TV channel, is to run the new Swedish terrestrial commercial service. Tests have already started from several Televerket PTT transmitter sites and the service is expected to start this month, with 60 per cent coverage by the summer and 95 per cent coverage by the end of 1993. The new Czech and Swedish networks should provide a lot of DX-TV potential during good conditions!

France: Though remaining on air for the time being the La Cinq channel has filed for bankruptcy. The Hatchette group, which has a 25 per cent stake, is to stop financing the service, which made a heavy loss last year.

Germany: The Pro 7 satellite TV service, which is intended mainly for cable distribution, is also being broadcast via a number of local terrestrial transmitters – some of them have been received in the UK. The following transmitter list has been supplied by the Benelux DX Club:

Bayern region: Munchen E45, Augsburg E26, Bayreuth E39, Nurnberg E21, Regensburg E24, Ansbach E35.

Bremen region: Bremen E46, Bremerhaven E8.

Rheinland-Pfalz region: Mainz E44.

Baden Wurttemberg region: Ravensburg E30, Friedrichshafen E35, Konstanz E60.

Hessen region: Kassel E60.

Saarland region: Eschberg E29, Dudweiler E35.

In addition the following stations are due to come into operation: Neu-Ulm E51, Wurzburg E41, Weilheim E57, Bamberg E30, Aschaffenburg E57, Rosenheim E38, Winterberg E56 and Deggendorf (channel allocation not yet made).

Switzerland: The movie-only Telecine Romandie channel, which uses a single transmitter at La Dole, is back in operation – it had closed down in May 1991 due to heavy losses. Programme coverage has been extended to include quiz shows, sports etc. The new owners are considering the lease of a satellite transponder to give national coverage. A new rival, the Huit Mont-Blanc regional TV service, is to start up just across the border from Geneva, in Annemasse, France.

In brief: TVE (Spain) has signed an agreement to revamp and expand the Bolivian Canal 7 service... An African

Prices, A = £2.50, B = £3.50.

Canal Plus service has been started in Senegal, called Canal Horizons. It will extend operations to the Ivory Coast and Tunisia by April and Gabon by the end of the year.

Satellite TV

The Eutelsat II F3 craft is now in operation at 16°E while the French Telecom 2A craft was successfully launched in mid-December.

Intelsat is promoting a 12-month period of digital audio distribution via the Intelnet network, with discounted rates for six-month rental periods. Intelnet has been extended to Russia. Seven new Intelsat craft have been authorised for delivery starting in the autumn of 1995. They will carry 32 C Band (4GHz) transponders, with two hemispheric, four zonal and six high-power global beams with a footprint e.i.r.p. of 36dBW, also six Ku band transponders with an e.i.r.p. of 47dBW. So far no type designation has been assigned to this new series of satellites. Intelsat has approved the establishment of the following new communications networks. ASETA will provide domestic and regional communications across the Andes, between Venezuela, Peru, Ecuador, Columbia and Bolivia, with a total of 19 36MHz bandwidth transponders available later this year. The Regional African Satellite Communications project (RASCOM) is to expand transponder availability for pan-African domestic and regional communications. Launch of the new Intelsat K satellite into orbit at 21.5°W is due this month. It will be co-located with the Intelsat V F2 craft.

Filmnet is now transmitting with D2MAC via the Astra and Eutelsat II F1 craft, including test scrambling with Eurocrypt. For the present Filmnet is maintaining its D2MAC Scandinavian beam in the clear.

The Italian state broadcaster RAI has developed an experimental digital audio/video satellite news gathering unit. Tests have already proved that the results are superior to those with standard analogue PAL. It should enable substantially lower powers and smaller dish sizes to be used.

The Japanese are concerned about the increasing number of satellites whose footprints include coverage of Japan. Several new satellite networks are due to come into operation in S.E. Asia in the next two-three years, all with regional rather than national coverage.

Cyril Willis has drawn our attention to the fact that the Super Channel transponder (Eutelsat II F1 at 13°E) carries satellite news on page 270. The news is changed each Tuesday and at the weekend. Readers' letters are included.

Finally some news briefs. CNN has signed a four-year deal with the Japanese broadcaster TV Asahi. The Australian government has sold the loss-making AUSSAT to Optus Communications. The final transponder on the C-Band ASIASAT-1 craft has been leased to the Chinese Ministry of Radio and TV for 32 radio channels and network distribution of the China Central Television 1 service.

Book Review

A second revised and considerably updated edition of *The Satellite Book – a Complete Guide to Satellite TV Theory and Practice*, edited by John Breeds, has been published by Swift Television Publications, 17 Pittsfield, Cricklade, Swindon, Wilts SN6 6AN (telephone/fax 0793 750 620). It starts with a clear outline of the theory – craft launch, geostationary orbiting, footprints, etc. We then come to the installation and mounting (both wall and



stand) of equipment. The wall section includes wind loading and tensile, shear and oblique forces for safe fixing – that's how detailed the book is, it even tells you how and where to tie the ladder. Cables, scart connectors, customer care, signals, noise and f.m., energy dispersal, dish and flat-plate aerial theory and practice are all there. Numerous excellent line drawings, many illustrating practical points, are included. My test for any good satellite book is the inclusion of a section on the Polyrod lens – yes, it's there! Substantial sections cover SMATV, the Astra and Eutelsat operations, MAC and its variants and scrambling, including Eurocrypt technology (as it relates to the UK – no Filmnet here). The book ends with a good glossary of terms, an index and a very useful list of addresses. There are 26 chapters and the book is in A4 format

It's an excellent book, well illustrated and presented. No self-respecting satellite installation engineer should be without a copy! The book is available from the publishers at £27.95 plus postage within the UK of £2.50 (£5 to continental Europe). An s.a.e. will bring a full list of other satellite publications available from Swift (address above).

READER SERVICE NUMBERS

Helpline 081 652 8620

For those having difficulty obtaining their monthly copy of *Television*.

Subscription hotline 0789 200 255

Use this number to take out a subscription using your Credit Card. For subscription rates see page 313.

TV Fault Finding

Reports from Philip Blundell, AMIEIE Alfred Damp, Steve Cannon, Ed Rowland, John Edwards, Stephen Leatherbarrow, Brian Storm and Chris Avis

Philips GR1-AX Chassis/Tashiko D14GP4

This set was reluctant to start up from cold. There was 15V across zener diode 6613 and the chopper transistor had its supplies, but there was no 95V output from the chopper circuit. I turned down the set-95V preset 3625 and tried again. This time the set started, but the overvoltage crowbar fired when the circuit was set for 96V output. Zener diode 6638 (BZX79-B36) in the h.t. sensing network was leaky.

P.B.

Grundig CUC 3400 Chassis

The colour would disappear intermittently, while at the same time the right-hand side of the picture would be blanked out. A scope check on the sandcastle pulse showed that it was misshapen when the fault was present. The TDA2579 timebase generator chip was faulty.

P.B.

Ferguson TX100 Chassis

This set had been a long-term problem in the workshop. It blew the chopper transistor intermittently and would sometimes go dead with no chopper tahsistor drive. During a rare occasion when it stayed dead for some minutes I was able to establish that the TDA4600-2 chopper control chip had a supply and a reference voltage but no output was present while the voltage at pin 4 was higher than normal. This is the pin to which the famous $300 \mathrm{k}\Omega$ (270k Ω or two separate resistors in some designs) resistor is connected. We've all in the past had trouble with this charging resistor. On this occasion however the associated charging capacitor C118 (8·2nF) had gone open-circuit. The value of the replacement capacitor should be 6·8nF as in later production.

Philips 2B Chassis

Due to insufficient bias at the base of the chopper transistor this set refused to start. The start-up bias is provided by R3656/7, C2658 and R3686/7. We checked all these components and though they seemed to be o.k. we replaced them. Still the set refused to start. Many hours were spent on the power supply, checking and replacing the various semiconductor devices, all to no avail. Many wonderful theories were put forward and tested, but the one thing about which we were relatively certain was that the bias was being damped by something in the chopper transistor's quite complex base circuit. Eventually, when it seemed that the best thing to do was to hide the set, pretend it no longer existed or replace every single component in the power supply, we got around to checking C2670 (68nF). It read correctly and no leakage could be detected using our component tester. We nevertheless replaced it. When the on/off switch was operated a strange noise came from within the set – it was the rustle of e.h.t. The set was working and has continued to do so.

Ferguson SRA1

This satellite TV receiver had a hum bar on its picture and wasn't tuning correctly. You could tune to the correct frequency to remove the sparklies from the picture, but

when the store key was pressed the tuning reverted to the previous, incorrect frequency. We took a look at the power supply section and saw that C2 (2,200 μ F, 16V) and C4 (100 μ F, 16V) appeared to be somewhat stressed. Both were leaky. Replacing them cured both faults. A.D.

Panasonic Z3 Chassis

A fault we've had a couple of times with this chassis is reduced height with poor linearity. In both cases the faulty component was C404 (4.7 μ F, 50V). It's used in the feedback circuit between the field output and ramp generator stages.

Sony KV2092

The problem with this set was that the volume would alter of its own accord or wouldn't adjust at all. Unfortunately it was an intermittent fault. While the set was playing up we carried out a check at the base of Q015, the volume buffer transistor in the line from the microcomputer and DAC chips, to see whether the d.c. level changed when the volume was adjusted. It did, so this eliminated the circuitry prior to Q015, putting us in a much better position when the fault next appeared for a reasonable time. When the set faulted again we carried out checks around Q019, Q021 and Q017, which process the volume on-screen display information. Q017 turned out to be faulty. As we didn't have a Sony replacement we fitted a BC546 which did the trick.

Salora H Chassis

When the aerial was disconnected the field folded over. Very odd. Mind you, the picture wasn't too good – the focus was way out and the brightness was too low. Also, a low-pitched humming noise came from the speaker. Where to start first? Well, when I was an apprentice I was told always to start at the tube. It's one of the best bits of advice I've heeded. The e.h.t. was low at about 20kV. I turned the set-e.h.t. potentiometer RTB700, only a tweak, and the meter needle went off the scale. I could picture sparks dancing from the e.h.t. cavity, up the meter and then my arm at any moment. I quickly switched the set off and checked my equipment, as you know what X-rays can do. Thankfully everything was intact. I then replaced the potentiometer itself, expecting a cure, but was disappointed. A replacement hybrid Ipsalo circuit control chip finally provided a cure.

Finlux 9000 Chassis

This set was brought to us because of low brightness. Curiously, when the tube's first anode voltage was increased the set developed a Hanover-bar effect then the colour-difference signals disappeared. After a great deal of head-scratching and unnecessary replacement of components the cause of the fault was found to be in the RGB output section, of all places. We disconnected the emitters of the RGB output transistors Tb5, Tb8 and Tb11 in turn. When the red channel transistor Tb5 was disconnected in

this way the brightness and chroma faults cleared. After this it was a straightforward case of checking the components in the red channel. This led us to Tb6 which was short-circuit collector-to-emitter. Normal operation was restored when a new BF881 had been fitted. The faulty transistor must, in addition to affecting the red channel, have been loading the colour decoder section chip which then shut down.

S.C.

Panasonic TX21T1

This was a brand new set, straight out of the box. After working for a couple of minutes picture sync was lost then the screen went blank, the power supply shut down and the set squealed. We turned the set off and allowed it to cool. The initial symptom was the giveaway: when the fault developed we squirted the TDA2579A line generator/sync chip IC501 with freezer. This restored normal operation for a couple of minutes. A new chip provided a permanent cure.

Ferguson TX90 Chassis

This set had no picture. When the first anode control was turned up we got a faint, watery image on the screen. Voltage checks around the BC307B beam limiter transistor Tr114 showed that its base was at 0.6V instead of 5.8V. The cause was eventually traced to the $143k\Omega$ resistor R231 which had gone open-circuit.

Fidelity CTV14S

The complaint with this set was no sound. We found that there was zero voltage at pin 14 of the TDA3190 sound chip. The source of the supply was traced back to D25 which was dry-jointed at its anode.

E.R.

Network NWC1410R

There was no sound as both the sound output transistors Q652/3 had failed. We replaced them along with, for good measure, the two 1Ω resistors R659/660 which were looking distressed. This restored the sound. **E.R.**

iTT CVC1210/1215 Chassis

The d.c. fuse Fu651 would blow at switch on. The culprit turned out to be C701 ($10\mu\text{F}$, 350V) which was short-circuit. If the problem is intermittent start up, replace C731, C733, C713, C703 and C701, also add a 1.8Ω resistor in series with the cathode of D712.

Saisho CM16R

A dead set though with the standby indicator on was due to failure of the STK7308 chopper chip IC501. After checking all the components in the power supply – it takes only a few minutes – and also checking for shorts at the line output transistor a new chip was fitted and the set was switched on. A long soak test proved that all was o.k. J.E.

Philips CP90 Chassis

This was a tricky fault. If the set was left alone it would work faultlessly all day and every day. If it was switched off and then on while hot however it would occasionally stay in the off mode. After many, many tests and component substitutions we found that D6670 (1N4148) was the cause.

SYSTEM DECODE 92

A highly profitable 'Bolt On' or 'Start Your Own' business. Decoding Philips radio/cassettes as fitted by Vauxhall, A. Rover, Peugeot, Renault, Volvo and others. 22DC series 570/670/680/751/752/755/846/864/954.

Due to demands on our Service Dept. and technical staff (approx 1000 units in 1991) we designed a system enabling NON TECHNICAL STAFF to perform the decoding operation.

SYSTEM DECODE 92 requires;

NO technical knowledge.

NO specialist equipment.

NO soldering.

NO spares/parts to buy.

NO waiting for 'timeouts'.

All you will need in addition to **'SYSTEM DECODE 92'** is a 12vdc power source and a few simple hand tools.

It's fast and easy, it snowballs and you start immediately to earn your share of the thousands to be made Decoding.

The demand is there. We also show you **EXACTLY** where and how to start the units rolling in, growing as required. Should you choose to expand your services, included also, are numerous fault reports, repair procedures, tips, data, suppliers etc. relating to the repair of these units.

All in all – a goldmine, and it pays for itself within the first 20 units. (Std. Charge £15 unit)

SYSTEM DECODE 92 £295. – (fully inclusive)

T.E.M.S., Dept. TV03, 36 Springvale, Gayton, Norfolk PE32 1QZ. (0553) 636618

Note: Only 200 System Decode 92 to be sold. Sorry. Not available within a 45 mile radius of E. Dereham, Norfolk. Please allow for cheque/PO clearance.

No fault could be found with it after removal, either when cold or hot, but a replacement cured the fault. S.L.

Contec KT8135

Field cramping when hot was found to be the result of C336 (220 μ F, 50V) developing a 10k Ω leak. S.L.

Solavox 140

Field collapse was simply a case of the LA7830 output chip going short-circuit. Its 3.3Ω feed resistor R122 had also failed. Replacements produced some scan, but with poor top linearity and some top compression. C108 $(1,000\mu\text{F})$ was responsible for this. We've seen these sets in Nikkai cabinets.

Saisho CT208TT

This teletext set displayed perfect text on all channels. Unfortunately when warm it would do so without being asked. We found that the culprit was the SAA5040B chip IC903. We've now had the fault several times. While it could be a batch problem, we feel that the position of the text panel could be a contributory factor. It's mounted horizontally, directly above the main chassis, at the top of the cabinet.

S.L.

Hitachi G6P Chassis

Failure of the line output transformer has been a frequent fault with these sets. With this one however the symptom was red streaks that appeared at random, starting at the left-hand side of the screen. They would then merge into a vertical red band at the left. This gradually broadened, with a ragged edge, filling the whole screen. The red raster would then brighten to the point at which flyback lines became visible. As a lot of work, with no success, had been carried out on the c.r.t. base and around the colour decoder chip, we decided to look elsewhere. The circuit diagram was consulted, and this gave us an idea. Maybe the graphics generator chip was at fault. A gentle puff of freezer on IC1104 (M50450-023P) proved the point. S.L.

Hitachi NP6CQ Chassis

This chassis, since its production many years ago, has been plagued by the intermittently dead condition. There are still many of these sets around however, giving good results. While dry-joints loom large as the likely cause of the intermittently dead fault, these days you usually have to look a little deeper. This time C919 ($3\cdot3\mu$ F, 25V) was going open-circuit when warm. Its associated with pin 4 of the CP901 chip. Use of freezer and a hairdryer provided a quick diagnosis.

Grundig CUC70 Chassis

These nice sets produce very good pictures and are extremely reliable. This one's discrete power supply was delivering a low output (70V) however and was twittering badly. It did the same when it was used to power a 100W bulb, proving that the power supply was the cause of the trouble. We eventually found that the 33V reference diode IC633 had a reverse leakage of around $26k\Omega$. S.L.

Ferguson TX10 Chassis

Here's a nice simple one for a change. A green screen was caused by the green output stage's $22k\Omega$ load resistor R664 being open-circuit. Its replacement, along with its counterparts in the R and B output stages, has become a routine job.

Ferguson TX85 Chassis

This fault caught me the first time I came across it. The same thing happened a few weeks later. Both sets came in dead. Initial checks showed that there was normal h.t. right up to the line output transistor. But there was no 15V output from the chopper circuit. I resoldered the various dry-joints you get around the chopper transformer and was rewarded with a good picture and sound. These disappeared as quickly as they had come. The cause of the problem is that L10 in the rectifier circuit that feeds the 12V regulator has a habit of going open-circuit in an irregular manner before it fails permanently. What can sometimes be a little disconcerting is that in L10's high-resistance condition the 12V regulator still receives an input of 12-15V, yet the set remains dead. This can lead you to suspect the regulator etc.

Panasonic Alpha 2 and 3 Chassis

Faulty teletext was the complaint with a TX25A2 (Alpha 3 chassis). Sure enough the channel flag and bar graphs drifted aimlessly across the screen while the text was erratic with flashing white lines in the background. A check on the 6MHz oscillator confirmed that it was running slowly, unlocked to the transmission. As the inputs to IC3501 seemed to be in order we fitted a replacement. No difference. We then carried out checks around IC3501 and

found that the 220pF capacitor C3511 in the 6MHz phase control circuit was leaky. We've since had the same fault with a TX24A1 (Alpha 2 chassis) which has the same text circuit.

B.S.

Ferguson 20E2 (TX90 Chassis)

We've had tuning problems with two of these sets. The first wouldn't search. We found that the $1k\Omega$ safety resistor R986 in the tuning circuit on the remote control panel was open-circuit. This was in turn due to the 150V tuning regulator supply being high because R56 on the line linearity/width panel had fallen in value from $2\cdot 4k\Omega$ to less than $1k\Omega$. When this had been attended to we discovered that channels could be found but not memorised. A new M293B1 memory chip (IC902) put that right.

The second 20E2 found channels up to around number thirty, but anything higher produced motorboating and again there was no memory. That's right, the voltage across the ZTK33B regulator D909 was low at 25V. But a different diode was to blame: D908, the 33V zener diode that stabilises the voltage at the base of transistor TR916, was leaky.

C.A.

Hitachi CPT2260/Salora Ipsalo 2

The mains fuse had blown, the filter resistor RB713 was open-circuit and the two BUW41B chopper transistors TB700/1 were short-circuit. After replacements had been fitted and the line scan coupling capacitor CB532 had been checked for dry-joints, the set produced nothing but a faint whistle. CB712 ($4\cdot7\mu$ F), the coupling capacitor to the base of TB701, had dried up. We decided to replace its partner CB726 in TB700's base circuit as well to be sure.

I now make a point of changing these two capacitors whenever this type of power supply appears on the bench. As in many other contemporary TV designs that use similar electrolytics mounted near hot components in high-frequency power supplies, these little capacitors work hard and are becoming a common cause of supply failure or erratic operation.

C.A.

Hitachi CPT2051

Field faults in these sets are usually caused by C608 (22μ F, 160V) which decouples the supply to the field output stage or dry-joints on the HM6251 field output module. Not this time however. There was still field collapse after the usual checks had been carried out. A limited amount of drive could be seen when the output at pin 4 of the module was checked with the scope, but it looked as though the output was heavily loaded. C609 (4.7nF) which is connected in parallel with the field scan coils had gone short-circuit, probably because it was mounted right against the hot h.t. feed resistor R607. We mounted the replacement capacitor under the PCB.

Philips NC3 Chassis

The owner of this set had rescued it from being scrapped by a national retail/servicing company and brought it to us because he knew where to come... The problem was reduced height with vivid horizontal ripples over the picture. We noticed that a replacement Hitachi picture tube had been fitted, with scan coils that were different from the original ones. The ripples went when the missing $1\cdot 2k\Omega$ damping resistor was fitted across the Hitachi field scan coils. Full scan was restored when the parallel-connected scan coils were rewired in series.

CD Player Casebook

Philips CD160

These machines occasionally suffer from poor or no loading drive. This particular machine would open the tray but would then refuse to close it. Usually the cause of the fault is the loading motor drive transistors, which often get very hot and have a tendency to burn up. They are mounted on the front panel and should be replaced with similar types. The circuit reference numbers are 6059, 6055 and 6056, all type BC328-40, and 6057/8, both type BC338-18. The Philips part numbers are 4822 130 41715 for the BC328-40, and 4822 130 40892 for the BC338-16. M.L.

Sony CDP-M20S

This player is part of a midi system and is powered by a separate 15V a.c. supply from the amplifier unit. The fault symptom was interesting and, luckily, its cause was easy to find. No play was the complaint. When a disc was inserted the machine seemed to focus on it all right and the TOC was read, with indication in the display. Immediately after the total track and playing time appeared however a zero came up in the display: after that there was nothing apart from the zero. When I pressed play the machine tried to find track one but gave up after a few seconds, then the disc stopped spinning. Exactly the same symptoms were present when another disc was tried.

When I removed the bottom cover I noticed that two areas of the machine suffered badly from dry-joints. Most noticeable were the areas around the a.c. supply socket and the STA341M tracking drive chip IC6. A good solder-up in these two areas provided a cure, the machine working very well afterwards. I've looked at a couple of similar machines since that first one. Both showed signs of drying up in the same two areas. One to watch out for.

M.L.

Philips FCD562

The report stated that this machine didn't work properly. When a disc was inserted, the machine would go into play. If stop was pressed after several minutes' the music would stop but the disc would continue to rotate. Furthermore open/close had no effect and the machine wouldn't open its tray. The player would work normally again for several minutes after interrupting the mains supply. The cause of the trouble was the MAB8441-T014 control/display chip on the front panel. Various component suppliers provide an MAB8441-T018 as a replacement: no modifications are required.

M.L.

Sony CDP-M35

The complaints were of skipping and taking a time to find tracks. Also the drawer would come back out after a disc had been loaded and there had been failure to read the TOC. The first item we replaced was the loading belt, which was worn. This belt operates the drawer drive mechanism and also the mechanism that lifts up the CDM to clamp the disc. The new belt cured the intermittent failure to read the TOC, but the unit still skipped and took a long time to find tracks. We tried a full alignment, but this didn't provide a cure. We eventually found that the tracking-coil driver transistors Q603 (2SC3666) and Q604

(2SA1426) and the focus coil driver transistors Q607 (2SC3666) and Q608 (2SA1426) were faulty. The 2SC3666 can be replaced with a BC639 while the 2SA1426 can be replaced with a BC640.

After replacing these transistors it's necessary to carry out both the focus bias (offset) and E-F balance adjustments. The machine should then be up to specification and should play the test disc. If it doesn't, the laser assembly is suspect. The drawer belt part number is 3-653-387-00.

P.J.R.

Pioneer PDM40

This six-disc multiplayer wouldn't read any of the discs – not even the TOC. On closer examination, guess what? Yes, the spindle motor was at fault. Normal operation was restored after fitting a new motor. The part number is PEA1028. Don't use a PYY1109, because the motor spindle is too short. Also make sure that you use a PD-M40 turntable height gauge, not the one for the PD-Z81M etc.

P.J.R.

Denon DCD660

This brand new player came from the shop with the complaint that it wouldn't read the TOC and hence wouldn't play. The laser focused and the disc rotated, but as tracking lock wasn't achieved the disc scon stopped again. The cause of the trouble was that connector CB101 hadn't been pushed fully home.

N.B.

Technics SLXP7

These early portable players are well built. This one was accused of cutting out at random whilst playing. We found that squeezing the lid down would produce the fault. The cause was the door/LD on switch. We also had to clean the copper hook on the door. One common fault with these players was also in evidence – intermittent failure to start to play due to a high-resistance traverse rest switch. Neither part is difficult to replace.

N.B.

MATTERS ARISING

Correction: The l.t. rectifier diode on the live side of the circuit was omitted in Fig. 1, page 276 last month. Its anode goes to the transformer winding and its cathode to the positive side of the reservoir electrolytic.

February cover: We should have mentioned that the free signal diodes were type 1N4148.

Satellite TV receiver project (December/January issues): Several readers have experienced difficulty in obtaining the sound demodulator chip IC7. The correct type number is XR215CN. It can be obtained in one-off quantity, cash with order, from Sabre Advanced Micro, Mead House, Suit 4, London Road, Bentley, Farnham, Surrey. Telephone 0420 22 004, fax 0420 22 008. Phone for latest price and delivery details before ordering.

Test Report: Beckman Industrial RMS225 DMM

David Botto

My first impression when I unpacked the recently introduced Beckman Industrial RMS225 digital multimeter was that it's a ruggedly built though slim instrument which looks as though it will stand up to hard use. The instrument fits snugly and securely into the hand. Its grey case is made of high-impact, fire-retardant thermoplastic material. I would have liked to have seen some identifying colours on the test lead sockets, the selector buttons and the meter's case. Some TV/VCR/computer engineers do however prefer the RMS225's uniform grey finish. The RMS225 measures $173 \times 71 \times 80$ mm (without its holster). It weighs 16oz. with holster and PP3 or equivalent battery.

Precision test gear should be treated with care. It's a fact of life however that DMMs are sometimes dropped. To guard against damage when this occurs, the RMS225 is supplied in a tough, rubbery protective holster. It can be removed from the holster and reinserted face down to protect the display whilst being carried around in the van. There's also a flex-strap to enable the meter to be hung from a point that's convenient for eye-level viewing.

The holster also provides test lead storage, a useful twoposition tilt stand and clips to hold the probes on the meter (see the accompanying photograph) whilst making singlehanded measurements. I found this holster arrangement handy for field servicing: instead of needing three hands one to hold the meter and the other two to hold the test probes - the meter and its case together form a single probe.

Ranges

The set-up procedure with some auto-ranging DMMs is almost like programming a computer. In this respect the RMS225 is definitely user-friendly. A simple menu selection method together with a full range of function annunciators removes the need for complex switching. I found it easy to select any of the four measurement modes - range lock, probe hold, relative and auto min/max using the three-button menu selector. A sturdy sevenposition rotary switch is used for on/off and function selection. A gentle beep is heard when a function or mode is selected.

Auto-range selection for maximum resolution is fully automatic. An auto-ranging DMM with a slow response

Table 1: Abridged electrical specification.

1V-1kV; resolution 0·1mV; D.C. voltage ranges:

accuracy 0.25 per cent (400V-

1kV 0·4 per cent).

10mA-10A; resolution 1μA; Current ranges - d.c.:

accuracy 0.75 per cent. A.C. voltage ranges (r.m.s.): 10V-750V; resolution 1mV;

accuracy 1.5 per cent. 10mA-10A; resolution 1μ A; Current ranges – a.c. r.m.s.:

accuracy 1.75 per cent.

1kΩ-40MΩ; resolution 0.1Ω ; Resistance ranges: accuracy 0.5 per cent (40MΩ

range 1.5 per cent).

Diode/continuity: Accuracy 1 per cent; maximum open-circuit voltage

3.3V; response time under 1sec; audible short-circuit indication. can be maddening to use, forcing you to lock in to one range. The RMS225's range-lock facility seems almost unnecessary however, since in the auto mode the RMS225 registered the measured value faster than my new manual DMM did.

Another time-saving feature is that, unlike many autoranging DMMs, you don't have to switch between volts/microvolts and milliamps/microamps - the meter does it for you. To use the high-current range you simply plug the positive test lead into the 10A socket.

Digital Count

The RMS225 is a full 4-digit instrument (10,000 count) with a maximum reading of 9999 that updates every half second. Until recently a DMM with such a specification cost a lot of money. The high-contrast readout digits are 12mm high and jet black. This full 4-digit readout gives you two or three times the resolution of a conventional 3.5-digit DMM. As an example of this, if the RMS225 is being used to measure the voltage on a 418V d.c. line it's possible to see a change as small as 0.1V. This resolution would of course be of no use with a meter whose accuracy was, as with many of the cheaper 3.5-digit meters, 0.8 per cent.

The claimed accuracy for the d.c. voltage ranges except between 400V-1kV is ± 0.25 per cent. At the higher voltages it's 0.4 per cent. With a.c. voltages the accuracy is 1.5 per cent while the ohms ranges have an accuracy of 0.5. per cent (except the $40M\Omega$ range where the accuracy is 1.5 per cent). For further details, see Table 1. Tests with precision voltage sources and accurate resistors showed that the above claims are justified.

Bar Graph

The RMS225 has, in addition to its digital display, a 41segment, rapid-response analogue bar-graph pointer. This updates at twenty times a second, which means that it responds to measurement variations faster than a multimeter with a conventional moving-coil analogue pointer. I thought it a pity that the bar-graph scale isn't numbered. The RMS225 was tried with various peaking and nulling adjustments: no analogue meter could have done a better job.

The bar graph is also nice to use when checking diodes. It takes less than a second to get a response with

Right: The Beckman Industrial RMS225 digital multimeter in its holster, which provides protection, storage and enables the meter to be used single-handedly as a



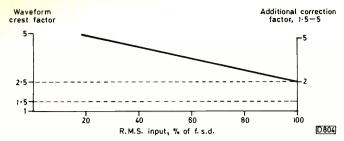


Fig. 1: Crest factor performance of the RMS225.

diode/continuity tests. In addition to the visual readout, a steady two-tone note is heard when a diode or semiconductor junction is short-circuit.

Offset Measurements

The relative mode is indicated by a function annunciator. Once this mode has been enabled, the input level signal used as the reference baseline value is displayed as 0.00. If for example the reference value is set to 50V and the meter probes are connected to a 40V supply, the value displayed is -10V. This mode is useful for zeroing out the resistance of the test leads when making low-resistance measurements and for making exact comparisons between components.

Probe Hold

The probe-hold feature enables you to freeze a measurement on the display. This is handy when it's difficult to look at the readout whilst making a measurement. A cheerful beep tells the user that a stable reading has been achieved. Only the numbers freeze – the bar graph still responds to input changes. This is useful when carrying out checks with intermittent faults.

Full-resolution Monitoring

If you suspect an intermittent voltage or voltage supply variation, you can connect the RMS225 and use its autoranging minimum/maximum record mode to monitor the suspect point – you can then get on with another job. If a new minimum or maximum reading is recorded, a beep note sounds to attract attention. By pressing the select button you can see both the maximum and the minimum recorded voltages. The recording period is unlimited.

Protection and Safety

All the voltage ranges are protected to 1kV and the resistance ranges to 500V. The current ranges are protected by special 600V fuses, which must not be replaced with standard fuses.

Beckman Industrial has obviously gone to a great deal of trouble regarding safety. The data says that the RMS225 meets the safety requirements of IEC348 class II and passes the strenuous IEEE587 6kV transient test.

When a measured voltage exceeds 25V, a dangerous voltage "lightning" symbol is displayed and the meter hiccups a double beep. This may not sound like a dangerous voltage. Under certain conditions however, for example if your hands are perspiring or the 25V supply is backed by a large current reserve, it could be fatal.

When the input signal exceeds the selected range limit with the range-lock mode enabled the meter displays a dOL prompt, telling you to put the meter back into the auto-range mode. Should the input signal exceed its maximum tolerance IOL appears, together with an insistent audible tone, warning you to remove the test probes from the circuit immediately.

The test leads have right-angled plugs at the socket end and finger-protection guards at the probe end. The input sockets could be improved however. Though the metal contact pieces are recessed and cannot be touched, it seems to me that it would be possible for an odd piece of wire, solder or a component lead to touch the metal of an unused socket. It would have been nicer to have had plastic insulated sockets of the type used with the Beckman Model DM27XL DMM.

Guarantee

Check the guarantee before buying a piece of test gear. Beckman assure me that before an RMS225 leaves the factory in the USA it receives a complete "burn-in cycle and a thorough computerised testing on all ranges". The accuracy specifications are guaranteed for at least one year, and the meter itself has a three-year guarantee.

On Test

During a thorough bench test I found that the RMS225 is convenient and easy to use. The fact that it measures true r.m.s. on the a.c. voltage and current ranges is a big advantage when you have to work with the spikey or digital waveforms encountered in TV/video/computer equipment. The readout digits could have been larger and the bar-graph scale properly numbered, even if these would have involved a slight price increase. But with the high contrast of both the analogue and digital displays I had no difficulty in reading the numbers.

The open-circuit ohms voltage measured across the test probes is 0.6V. This is a little high for in-situ printed circuit resistance checking when semiconductor junctions are present. In practice however I found that in-circuit checking is possible except where the circuitry contains resistors that measure in the $M\Omega$ range.

Battery life is 500 hours provided an alkaline battery is fitted. A little battery picture appears in the display when the battery life left is approximately fifty hours. Should you forget to switch it off, the RMS225 powers down automatically after one hour. On the resistance ranges the display blanks out after six minutes. Obviously the designers know something of the habits of TV/video/computer engineers!

Conclusion

In conclusion, I really would have liked to have bought an RMS225 for myself, but as I already possess three excellent DMMs I couldn't think of an excuse to do so – not one that would convince my wife, anyway. Regretfully the meter had to be returned to Beckman.

The price of the RMS225 is £120 plus VAT, which is surprisingly low for a true r.m.s., 10,000 count instrument. The price includes the holster and test leads and a nicely printed, easy-to-understand operator's manual. It's available from Beckman Industrial Ltd., Astec Building, High Street, Wollaston, Stourbridge, West Midlands DY8 4PG – telephone 0384 442 393.

The TP850 temperature probe and a.c. and d.c. clampon current probes are available as extras.

My thanks are due to Sue Round of Beckman Industrial for the loan of the instrument for assessment.

USE YOUR ACCESS OR VISA

雷 TEL 0902 773122/712083

DECLARATION OF QUALITY

AS DISTRIBUTORS OF QUALITY VIDEO SPARES FOR THE LAST TEN YEARS, WE FULLY UNDERSTAND THE REQUIREMENTS OF THE REPAIR TRADE. THERE IS A CERTAIN QUALITY WHICH MUST BE MAINTAINED IN ORDER TO EXECUTE <u>HONEST</u>, <u>RELIABLE</u> REPAIRS. THEREFORE, WE GUARANTEE THAT ALL VIDEO SPARES SUPPLIED BY US ARE OF THE FINEST QUALITY AND WE CAN ASSURE YOU THAT ALL STOCKED ITEMS WILL BE DISPATCHED THE SAME DAY.

AIWA AV-66 Video Head Phich Roller Bell Kit Idder Replacement Set Idder Capstan Motor Tension Band Reel Table Rubber Ty CTL Unit	VID 1005 £1.81 VID 2160 £24.27 VID 1423 £3.54	3-V-36 Video Head Pinch Roller Belt Kit Take Up Clutch Take Up Idler Reel Idler Brake Pad Capstan Motor Loading Motor Front Loading Motor Tension Band	Part No. Price VID 2647 59.81 VID 1813 53.05 VID 7543 50.99 VID 1031 53.21 VID 1038 51.56 VID 1039 51.56 VID 2168 59.30 VID 2168 59.30 VID 2168 69.30 VID 1981 51.48 VID 1389 51.73	FVH-P722/725 Video Head Pinch Roller Belt Kit Gear Idler Idler Loading Gear Set Cassette LED Tension Band Take Up Reel Table Supply Reel Table FVH-P980K/KV Video Head	Part No. Price VID 2501 221.95 VID 1810 23.63 VID 1813 51.05 VID 1013 54.95 VID 1014 122.80 VID 1230 51.65 VID 1981 52.80 VID 1981 52.80 VID 1981 55.77 VID 1295 57.83 VID 1295 55.77 VID 2501 524.43	VT-16 S Video Head Pinch Roller Belt Kit FF/REW Idler Arm Clutch Plate Capstan Motor Cassette LED Tension Band Repair Kit VT-33/330	Part No. Price VID 2505 £24.67 VID 1788 £3.05 VID 7538 £1.23 VID 1020 £1.73 VID 211 £3.81 VID 2147 £18.02 VID 1981 £1.48 VID 1379 £2.31 VID 7922 £16.50	HR-D110/111/120 Video Head Pinch Roller Belt Kit Take Up Clutch Take Up Idler Reei Idler Brake Pade Capstan Motor Loading Motor Cassette Loading Motor Cassette Loading Motor Cassette Loading Motor Cassette Loading Motor	Parl No. Price //121 VID 2647 VID 1813 VID 7543 VID 17543 VID 1038 VID 1031 VID 1038 VID 1031 VID 1038 VID 1031 VID 1036	NV-300/333 Video Head Pinch Roller Belt Kil Play Idler Idler Idler Arm Cam Gear Intermediate Gear Driving Gear Reel Motor Capstan Motor	Part No. Price VID 2520 53.95 VID 1787 53.83 VID 1787 54.84 VID 1048 52.58 VID 1057 50.94 VID 1215 51.08 VID 1216 51.23 VID 1217 50.99 VID 2421 53.43 VID 1222 53.43 VID 12
Video Head Pinch Roller Belt Kit idler Replacement Sel FWO Limiter idler idler Capstan Motor Tension Band CTL Unit	VID 2546 E16.95 VID 1755 53.87 VID 7509 C1.95 VID 1000 55.62 VID 1002 53.37 VID 1004 51.40 VID 1005 51.81 VID 2118 528.50 VID 1423 53.54 VID 2567 \$46.43	reision Bain Remote Control Repair Kit Mains Transformer Take Up Reel Table Rubber Tyre Supply Reel Table Rubber Tyre Cassette Housing 3-V-57 Video Head	NR 9100 £11.92 VID 7918 £18.09 VID 2223 £21.61 VID 1080 £0.66 VID 1080 £0.66 VID 1099 £20.61 VID 2573 £17.29	Pinch Roller Belt Kit Idier Ciutch Cassette LED Tension Band Supply Reel Table FUNAI VCR-4600 Video Head	VID 1318 24.43 VID 1818 23.05 VID 7568 22.40 VID 1093 24.35.22 VID 1981 21.48 VID 1377 22.10 VID 1296 £10.97	Video Head Pinch Roller Belt Kit FF/REW Idler Arm Clutch Plate Capstan Motor Cassette LED Tension Band Repair Kit	VID 2504 £19,94 VID 1788 £3.05 VID 7538 £1.23 VID 1020 £1.73 VID 1211 £9.81 VID 2146 £18.02 VID 1981 £1.48 VID 1379 £2.31 VID 7922 £16.50	Cassette LCV Tension Band Repair Kit Mains Transformer Take Up Reel Table Rubber Tyre Supply Reel Table Rubber Tyre Cassette Housing	VID 1981 21.43 VID 1389 21.73 VID 7918 218.09 VID 2223 221.61 VID 1080 20.66 VID 1080 20.66 VID 1099 220.61	Cassette LED Tension Band Repair Kit Take Up Reel Table PHILIPS Video Head Pinch Roller Bett Kit Idler Loading Gear	VID 1982
AKAI VS-9800 Video Head Pinch Roller Beit Kit Take Up Idler REW Idler	VID 2511	Pinch Roller Belt Kit Clutch Mechanism Capstan Motor Loading Mutor Front Loading Motor Cassette LED Tension Band	VID 1813 \$3.05 VID 7540 \$0.66 VID 7540 \$0.66 VID 2188 \$44.62 VID 2167 \$13.69 VID 2168 \$9.30 VID 1981 \$1.48 VID 1388 \$2.06	Pinch Roller Belt Kil Clutch Gear Holder RF Clutch Cassette LED VCR-5843 Video Head	VID 1758 23.05 VID 7593 21.73 VID 1226 24.32 VID 1227 211.70 VID 1231 25.52 VID 1981 21.48 VID 2708 224.31	VT-61/62/63/64 Video Head Princh Roller Beit Kit FF/REW Idier Arm Clutch Plate Capstan Motor Cassette LED	VID 2628 £24.25 VID 1818 £3.05 VID 7583 £3.87 VID 1020 £1.73 VID 1211 £9.81 VID 2154 £18.02 VID 1981 £1.48	VX-850 Pinch Roller Belt Kit Clutch Idler Cassette LED MITSUBISH	VID 1815	Idier Idier Limiter Roker Cassette LED Tension Band Repair Kit VR-6540 Video Head	VID 1370 £1.98 VID 1371 £5.94 VID 1440 £1.32 VID 1981 £1.48 VID 1400 £2.55 VID 7906 £8.92 VID 2537 £19.61
Unloading Idler FF Rubber Tyre FF Rubber Tyre Unloading Idler Rubber Tyre Capstan Motor Drum Motor Cassette Lamp	VID 1027	Repair Kit Cassette Housing FV-10B Video Head Pinch Roller Belt Kit Idler Arm Reel Motor	VID 7920 £17.58 VID 1315 £20.61 VID 2580 £25.68 VID 1817 £11.25 VID 7564 £2.72 VID 1091 £2.31 VID 2193 £15.04	Pinch Roller Belt Kit Idler Cassette LED GEC V-4004 Video Head Pinch Roller	VID 1758 C3.05 VID 7615 C3.67 VID 1364 C2.25 VID 1981 C1.48 VID 2506 C16.08 VID 1788 C3.05	Tension Band Repair Kit VT-8000/8500 Video Head Pinch Roller Belt Kit Take Up Idler Wind Roller	VID 1379	HS-307 Video Head Pinch Roller Belt Kit Reel Idler Unit FF Idler Rubber Tyre Capstan Rubber Tyre Cam Gear A Gear 2	VID 2606 £71.56 VID 1808 £3.05 VID 7542 £1.58 VID 1040 £8.48 VID 1081 £0.74 VID 1264 £1.32 VID 1275 £1.20 VID 1275 £1.20	Pinch Roller Belt Kit Idler Master Cam Reel Motor Loading Motor Cassette LED Tension Band	VID 1815 \$25.19 VID 7547 \$00.90 VID 1060 \$1.89 VID 1265 \$6.52 VID 2127 \$26.06 VID 2142 \$14.35 VID 1981 \$1.48 VID 1420 \$25.10
Tension Band Repair Kit Take Up Rubber Tyre ALBA VCR-4000 Video Head Pinch Roller	VID 2713 £23.74 VID 1787 £3.63	Capstan Motor Loading Motor Front Loading Motor Cassette LED Tension Band Repair Kit FV-12L Video Head	VID 2190 £25,53 VID 2412 £6.18 VID 2412 £6.18 VID 1981 £1.48 VID 1386 £1.65 VID 7921 £14.16 VID 2581 £37.81	Beit Kit FF/REW Arm Clutch Plate Capstan Motor Cassette LED Tension Band Repair Kit GOLDSTAR GHV-8000/8200/8	VID 7538 E1.23 VID 1020 E1.73 VID 1211 E9.81 VID 2148 E18.02 VID 1981 E1.48 VID 1379 E2.31 VID 7922 E16.50	FFIREW Idier Capstan Motor Tension Band Remote Control Repair Kit Take up Reel Table Supply Reel Rubber Tyre	VID 1023 52.88 VID 2155 650.50 VID 1381 51.98 VID 7928 615.49 VID 1302 611.47 VID 1300 60.74	Cam Gear B Gear 1 Cassette LED Tension Band Take Up Reel Table Supply Reel Table HS-318	VID 1276 £1.27 VID 1277 £1.27 VID 1981 £1.48 VID 1393 £2.55 VID 1307 £2.92 VID 1299 £2.70	PYE DV-761 Video Head Pinch Roller Belt Kit Idler Loading Gear Modification Set	VID 2621 E82.18 VID 1827 57.00 VID 7588 £1.56 VID 1252 £3.97 VID 1253 £5.37 VID 1254 £10.35
Belt Kit tdler Cassette LED Tension Band AMSTRAD VCR-4600 Video Head Death Belter	VID 7596 23.63 VID 1049 24.05 VID 1981 21.48 VID 1399 22.64	Pinch Roller Belt Kit Idler Arm Reel Motor Capstan Motor Loading Motor Front Loading Motor Cassette LED	VID 1817 £11.25 VID 7564 £2.72 VID 1091 £2.31 VID 2193 £15.04 VID 2190 £25.53 VID 2412 £6.18 VID 2412 £6.18 VID 1981 £1.48	Pinch Roller Belt Kit Idler Bracket Centre Clutch Gear Limiter Roller Cassette LED Tension Band	VID 1815	VT-9300/9500/970 Video Head Pinch Roller Belt Kit FF/REW Idler Arm Play Idler FS Brake	VID 2509 £15.96 VID 1788 £3.05 VID 7802 £0.90 VID 1019 £2.88 VID 1075 £3.79 VID 1212 £1.73	Video Head Pinch Roller Belt Kit Reel Idler Unit FF Idler Rubber Tyre Capstan Rubber Tyre Cam Gear A Gear 2	VID 2607 £42.37 VID 1808 £3.05 VID 7559 £2.85 VID 1040 £8.48 VID 1081 £0.74 VID 1264 £1.32 VID 1274 £1.20 VID 1275 £1.20	Tension Band SAISHO VR-2000/3800 Pinch Roller Belt Kit Idler Reel Motor Cassette LED	VID 1431 £4.27 VID 1815 £5.19 VID 7565 £1.07 VID 1060 £1.89 VID 2121 £14.24 VID 1981 £1.48
Pinch Roller Belt Kit Clurich Gear Holder RF Clutch Cassette LED VCR-9000 Video Head	VID 1758 £3.05 VID 7593 £1.73 VID 1226 £4.32 VID 1227 £11.70 VID 1231 £6.52 VID 1981 £1.48	Tension Band Repair Kit FIDELITY VCR-100 Video Head Pinch Roller Belt Kit Clutch	VID 1386 £1.65 VID 7921 £14.16 VID 2502 £14.72 VID 1758 £3.05 VID 7593 £1.73 VID 1226 £4.32	VCP-4100/4130 Video Head Pinch Roller Bet Kit Idler Bracket Centre Ciutch Gear Limiter Roller	VID 2645 863,81 VID 1815 55.19 VID 7585 51.32 VID 1052 51.98 VID 1223 525.81 VID 1228 52.22 VID 12440 51.32	Capstan Motor Cassette Lamp Fension Band Remote Control Repair Kit Take Up Reel Table	VID 2156 £57.81 VID 1951 £0.90 VID 1382 £1.80 IR 9096 £14.92 VID 7927 £15.49 VID 1303 £8.32	Cam Gear B Gear 1 Cassette LED Tension Band Take Up Reel Table Supply Reel Table NEC N-830 EG/831/832	VID 1276 £1.27 VID 1277 £1.27 VID 1981 £1.48 VID 1393 £2.55 VID 1307 £2.92 VID 1299 £2.70	SALORA SV-8620 Pinch Roller Belt Kit FF/REW Idler Arm FF/REW Idler Arm FF/REW Idler	VID 1808 \$23.05 VID 7600 \$23.13 VID 1233 \$2.97 VID 1234 \$2.85 VID 1235 \$1.12
Pinch Roller Belt Kit RF Clutch Clutch Gear Holder Cassette LED	VID 2502 £15.45 VID 1758 23.05 VID 7592 £1.15 VID 1225 £3.82 VID 1226 £4.32 VID 1227 £11.70 VID 1981 £1.48	Gear Holder RF Clutch Cassette LED FTNLUX VR-1030 Video Head Pinch Roller Idier	VID 1227 £11.70 VID 1231 £6.52 VID 1981 £1.48 VID 2558 £42.99 VID 1803 £4.12 VID 1006 £2.80 VID 1432 £5.17	Cassette LED Tension Band VCP-4200/4326 Video Head Pinch Roller REW Belt Cassette LED GRANADA	VID 1981 E1.48 VID 1399 E2.64 VID 2645 E63.81 VID 1815 E5.19 VID 7234 E0.37 VID 1981 E1.48	VR-3913 Video Head Pinch Roller Belt Kit Reel Idler Take Up Clutch Take Up Idler Brake Pad Reel Idler	VID 2511	Video Head Pinch Roller Belt Kit Talke Up Clutch Take Up Idler Reel Idler Brake Pad Capstan Motor	VID 2647	Cassette LED Tension Band Take Up Reel Table Supply Reel Table SAMSUNG VI-510/520/511/61 Video Head Pinch Roiler	VID 1394 \$2.92 VID 1308 \$4.72 VID 1305 \$4.12
BANG & OLUFSE VHS-65 Video Head Pinch Roller Belt Kit FFIREW Idler Arm Clutch Plate Capstan Motor Cassette LED	VID 2506 £16.08 VID 1788 £3.05 VID 7538 £3.05 VID 7538 £1.23 VID 1020 £1.73 VID 1211 £9.81 VID 2147 £18.02 VID 1981 £1.48	Tension Band Remote Control Repair Kil VR-2010 Video Head Pinch Roller Belt Kit Idler	IR 9034 £13.45 VID 7930 £12.76 VID 2578 £56.31 VID 1827 £7.00 VID 7588 £1.56 VID 1252 £3.97	VHS-EY1/EY2 Video Head Pinch Roller Belt Krt Reel Drive Unit Loading Gear A Loading Gear B Capstan Motor Cassette LED	VID 2539 £16.35 VID 1822 £3.21 VID 7605 £2.47 VID 1255 £7.09 VID 1268 £1.72 VID 1271 £1.20 VID 2404 £39.37 VID 1981 £1.48	Reel Motor Capstan Motor Loading Motor Cassette Lamp Tension Band Repair Kit Take Up Reel Table Rubber Tyre Supply Reel Table	VID 2169 £28.12 VID 2164 £37.18 VID 2168 £9.30 VID 1947 £0.42 VID 1389 £1.73 VID 7913 £18.95 VID 1080 £0.66	Loading Motor Front Loading Motor Cassette LED Tension Band Repair Kit Mains Transformer Take Up Reel Table Rubber Tyre	VID 2168 Ω9.30 VID 2168 Ω9.30 VID 1981 Ω1.48 VID 1389 Ω1.73 VID 7918 Ω18.09 VID 2223 Ω21.61 VID 1080 Ω0.66	Beft Kit Idler Idler Reel Motor Capstan Motor Loading Motor Cassette LED VX-710/720/730	VID 1815
DECCA VRH-8300 Video Head Pinch Roller Belt Kit Reel Idler Take Up Clutch	VID 2511	Loading Gear Modification Set Tension Band Remote Control FISHER FVH-P520 Video Head Proch Roller	VID 1253	Tension Band GRUNDIG MVS-400 Video Head Pinch Roller Beti Kit Idler Loading Gear	VID 1414 £6.18 VID 2596 £16.62 VID 1757 £3.21 VID 7567 £1.87 VID 1052 £1.98 VID 1222 £2.25	Rubber Tyre VR-3993 Video Head Pinch Roller Belt Kit Reel Idler Take Up Clutch	VID 1080 20.56 VID 2647 29.81 VID 1814 23.05 VID 7523 21.32 VID 1036 22.80 VID 1037 23.05	Supply Reel Table Rubber Tyre Cassette Housing N-895 Video Head Pinch Rolfer Belt Kit Clutch Mechanism	VID 1080	Video Head Pinch Roller Beit Kit Cassette LED SANYO VHR-1100 EX/EE! Video Head	VID 2583 £25.68
Take Up Idler Brake Pad Reel Motor Capstan Motor Cassette Lamp Tension Band Repair Kit Take Up Reel Table	VID 1038 £1.56 VID 1361 £0.36 VID 2169 £28.12 VID 2164 £37.18 VID 2168 £9.30 VID 1947 £0.42 VID 1389 £1.73 VID 7913 £16.95	Bett Kit Take Up Idler ff://REW Pulley Idler Tension Band Take Up Reel Table Rubber Tyre Supply Reel Table Rubber Tyre	VID 7532 C1.89 VID 1015 25.36 VID 1016 20.85 VID 1023 22.88 VID 1378 22.31 VID 1293 20.66 VID 1293 20.66	Clurch Gear Limiter Roller Cassette LED Tension Band Remote Control VS-520 GB Video Head Pinch Roller	VID 1228	Take Up Idler Roller Bar Brake Pad Reel Motor Capstan Motor Loading Motor Front Loading Motor Cassette Lamp	VID 1038 £1.56 VID 1363 £3.86 VID 1361 £0.36 VID 2169 £28.12 VID 2168 £9.30 VID 2168 £9.30 VID 2168 £9.30 VID 1946 £0.49	Capstan Motor Loading Motor Front Loading Motor Cassette LED Tension Band Remote Control Repair Kil Cassette Housing	VID 1082 £15.37 VID 2166 £50.43 VID 2167 £13.69 VID 2168 £9.30 VID 1981 £1.48 VID 1387 £2.25 IR 8947 £20.37 VID 7919 £22.18 VID 1315 £20.61	Pinch Roller Belt Kit Reel Drive Roller Reel Motor Cassette LED Tension Band VHR-1500 EX/G Video Head	VID 1787 £3.63 VID 7558 £2.49 VID 1076 £6.27 VID 2198 £13.04 VID 1981 £1.48 VID 1411 £2.40 VID 2585 £46.87
Rubber Tyre Supply Reel Table Rubber Tyre FERGUSON 3-V-30 Video Head	VID 1080 \$0.66 VID 1080 \$0.66	FVH-PS30 Video Head Pinch Roller Belt Kit Take Up Idler FF/REW Pulley Idler Tension Band	VID 2500 £21.95 VID 1788 £3.05 VID 7532 £1.89 VID 1015 £5.36 VID 1016 £0.85 VID 1023 £2.88 VID 1023 £2.88	Timing Bett Centre Pulley Cassette LED Tension Band HINARI VXL-30/35/4 Video Head Pinch Roller	VID 1482 £7.29 VID 1482 £7.20 VID 1482 £7.20 VID 1981 £1.48 VID 1401 £3.37 VID 2518 £21.00 VID 1815 £5.19	Tension Band Repair Kit Take Up Reel Table Rubber Tyre Supply Reel Table Rubber Tyre	VID 1389 £1.73 VID 7914 £20.34 VID 1080 £0.56 VID 1080 £0.66	N-9013/9014/9033 9053/9054/9055 Video Head Pinch Roller Belt Kit Reel Drive Pulley Cassette LED		Pinch Roller Bett Kit Reel Drive Roller Reel Motor Cassette LED Tension Band VTC-M10/11/20/21 Video Head	VID 1787
Princh Roller Belt Kit Reei Idler Take Up Clutch Take Up idler Brake Pad Reel Motor Capstan Motor Loading Motor	VID 1814 33.05 VID 7812 51.07 VID 1036 52.80 VID 1037 53.05 VID 1038 51.36 VID 2169 528.12 VID 2164 527.18 VID 2168 59.30	Take Up Reel Table Rubber Tyre Supply Reel Table Rubber Tyre FVH-P720/720K/7 Video Head Pinch Roller Belt Kit	VID 1293 20.56 VID 1293 20.66	Beit Kit Chutch Idler Loading Motor Cassette LED HITACHI VT-11 Video Head Pinch Roller	VID 7566 £2.31 VID 1316 £5.47 VID 1317 £3.54 VID 2167 £13.69 VID 1981 £1.48 VID 2504 £19.94 VID 1788 £3.05	HR-3300 Video Head Pinch Roller Belt Kit Take Up Idler Large REW Idler Unloading Idler FF Rubber Tyre Unloading Idler	VID 2511 29.95 VID 1756 22.95 VID 7506 21.56 VID 1025 24.65 VID 1027 29.30 VID 1029 20.78	PANASONIC NV-2000/2010 Video Head Pinch Roller Belt Kit Idler Idler Idler Cam Gear	VID 2520 E9.81 VID 1757 £3.21 VID 17800 £1.73 VID 1054 £0.85 VID 1055 £0.85 VID 1055 £0.85	Pinch Roller Belt Kit Reel Drive Pulley Idler Reel Motor Tension Band Supply Reel Table SENTRA	VID 1758 £3.05 VID 7809 £0.45 VID 1079 £5.94 VID 1219 £1.90 VID 2179 £17.39 VID 1408 £1.87 VID 1319 £8.62
Cassette Lamp Tension Band Repair Kit Take Up Reel Table Rubber Tyre Supply Reel Table Rubber Tyre	VID 1947 50.42 VID 1389 £1.73 VID 7913 £18.95 VID 1080 £0.66 VID 1080 £0.66	Gear Idler Idler Loading Gear Set Cassette LED Tension Band Take Up Reel Table Supply Reel Table	VID 1013 £4.95 VID 1014 £2.80 VID 1230 £1.65 VID 1981 £1.48 VID 1376 £2.10 VID 1295 £7.83 VID 1294 £5.77	Bell Kil FF/REW Idler Arm Clutch Plate Capstan Motor Cassette LED Tension Band Repair Kil	VID 7538 £1.23 VID 1020 £1.73 VID 1211 £9.81 VID 2147 £18.02 VID 1981 £1.48 VID 1379 £2.31 VID 7922 £16.50	Rubber Tyre Rubber Tyre Capstan Motor Drum Motor Cassette Lamp Tension Band Repair Kit Take Up Rubber Tyre	VID 1207 00.90 VIO 2119 242.31 VID 2120 £18.73 VID 1943 00.35 VID 1391 £3.54 VID 7911 £15.45 VID 1028 00.75	Intermediate Gear Driving Gear Cassette Lamp Tension Band Repair Kit Take Up Reel Table Supply Reel Table	VID 1216 S1.23 VID 1217 S0.99 VID 1948 S0.24 VID 1397 C3.38 VID 7901 E19.35 VID 1312 £10.12 VID 1310 S8.62	VX-5000/8000 Video Head Pinch Roller Bell Kit (diler Cassette LED Tension Band	VID 2713 £23.74 VID 1787 £3.63 VID 7596 £3.63 VID 1049 £4.05 VID 1981 £1.48 VID 1399 £2.64

NEW IN STOCK, A LARGE RANGE OF SLIMLINE REMOTES.
JUST SUPPLY MAKE, MODEL & PART No. FOR AN
IMMEDIATE QUOTE. REGISTERED OFFICE:
THE COACH HOUSE, MUXTON LANE, TELFORD
MAIL ORDER — CALLERS STRICTLY BY APPOINTMENT

NEW FAX NUMBER 0902-29052 10,000 Line Catalogue available with order, or by request. SAE please (9" x 4"). Telephone 0902-712083/773122 (24hr. answering machines for Access & Barclaycard users.)

Prices quoted are subject to stock availability and may be changed without notice.

For quantities of 100+ per line — Please ask for special quote.
Orders from Gord, Institutions, Schools Nationals etc., accepted with official order,
All goods schould be seleviered within 4 working slays.

TRADE COUNTER OPEN DAILY 9am-5pm

VCR Clinic

Ferguson 3V59/JVC HRD180

The fluorescent and LCD displays would go off intermittently though the machine still worked. A look at the Ferguson fault diagnosis pocket book suggested that the timer chip IC101 was suspect in this event, so a replacement was fitted. Unfortunately the fault persisted. Interrupting the mains input would bring back the supplies, so it seemed that something was causing the timer chip to freeze – but what? A scope was left connected to the 5V supply line. This showed that the voltage dropped momentarily. We traced back to the 12V supply and found that this also dropped occasionally. The STK5481 regulator chip was faulty. I suppose I had to come across an intermittent one sometime!

Philips VR6670

This machine had no colour in either the E-E, play or record modes. The dealer had already changed the TDA3760 and TDA3755 chips. As the play/record switching voltages were correct I used a scope to trace the chroma signal through the TDA3760. It went in at pin 2, came out at pin 27 but was missing at pin 23. The BC548B emitter-follower transistor 7102 was open-circuit.

P.B.

GoldStar GHV1246I

With most VCRs poor rewind means a worn idler or slack belts. With this machine however the brakes weren't coming off in the wind modes, though they did in play. They are operated by a shaped steel plate whose hook was worn. A new slide plate (AY) was required – part no. 256-218B.

P.B.

Philips VR6870

When play was selected the drum turned only very slowly. Then, after a few attempts, the cassette would eject. The drum drive transistors all tested o.k. and the loom to the motor was intact, so another motor was connected temporarily. The drum motor was faulty.

P.B.

JVC HRD520

There were tracking lines when prerecorded tapes were played. On inspection you could see that the tape wasn't riding along the knife edge on the lower drum. As the rotary guide locking screws were loose the guides were adjusting themselves as the tape played. All that was necessary was to reset the guides and tighten the screws. Had the phantom fiddler passed this way?

P.B.

Akai VS23

This machine came in with a crunched tape and a rude note – rental customers very often send rude notes with their gear. Inspection showed that the mechanism was at odds: the FL cradle was in the fully-ejected position while the tape guides were in the loading complete positions. Yet they are all driven by the same motor! We rephased the deck mechanics, tested the machine and returned it. With hindsight this was a foolish act...

A week later the machine was back with another chewed

Reports from Philip Blundell, AMIEIE, Eugene Trundle, John Edwards, Brian Storm, Michael Dranfield, Stephen Leatherbarrow and Brian Davidson

tape and an even ruder note threatening rental termination. The mechanics were in the same contradictory state as before. After much testing and head-scratching we found the cause of the trouble. On the front left-hand side of the deck there's a vertical steel plate which carries the plastic cogs and pinions that drive the FL cradle. The plate had bent to the left, the result being that the FL pinion could – maybe once in fifty loading operations – jump out of phase.

JVC HRD230/Ferguson FV12L

There's a well known weak spot in certain JVC VCRs. It's cured by fitting a shakeproof washer to the under-deck PCB fixing screw to ensure a good electrical earth connection. This is not relevant to the HRD230, but we had one whose play or record would be suddenly interrupted at random times, reverting to the stop mode. It was because the reel pulses disappeared. To obtain a reliable earth connection for the optocoupler we had to fit a tiny shakeproof washer to the reel sensor PCB assembly's fixing screw.

Hitachi VT63/64

The problem was failure of the deck functions, though cassette and tape loading worked all right. The drum motor didn't turn at all, and the capstan motor ran only during tape loading and unloading – which at least prevented the tape from being chewed! The cause of the fault was failure of the 12V regulator within the STK5451 power supply chip. Its output was down at 2.7V except when boosted during the motor-start phase (while the tape guides are on the move).

Ferguson 3V43/JVC HRD725

Tape playback was normal but there was no E-E audio. The cause was traced to circuit protector CP3 on the FMA board being open-circuit. It's in the 12V feed to the f.m. circuit and seems to fail for no apparent reason.

J.E.

Osaki VCR31

No E-E, just snow, with the channel indicators working o.k. were the symptoms with this machine. Q755 was open-circuit base-to-emitter. J.E.

Lloyd LV44

The channel indicators were o.k. but there was no picture or sound in the E-E mode. The cause was traced to R21 $(1.8k\Omega)$ on the tuner/i.f. board being open-circuit. It supplies the 30V tuning voltage.

Akai VS1

In both the E-E and playback modes the monitor screen displayed a rectangular box that contained rows of letter As. The box flashed on/off at the clock rate. Outside the box there was just a blank raster. The character generator chip is IC2, type MB88303M. It's mounted on the front

clock/timer board. Voltage checks at its pins produced correct readings as per the manual except at pins 12 and 13, which were at 5V instead of 0·1V. Replacing IC2 cured the problem.

J.E.

Panasonic NV-M7B

The complaint with this camcorder was no drum drive. All the drum drive and power supply chips had been changed by the dealer to no avail. Careful voltage checks revealed nothing unusual except that when play was selected the drum power dropped momentarily to almost nothing. Although the power chips had been changed, suspicion was heading towards them. So a bench power supply was hooked to the drum power line. The drum then sprang to life.

In this camcorder feedback from the drum and capstan drive chips to the power supplies regulates the operation. The drum feedback is applied to the regulator chip via a $150 \mathrm{k}\Omega$ resistor which is decoupled by a $1 \mu \mathrm{F}$ capacitor. When I eventually managed to remove this surfacemounted capacitor from beneath a crystal and coil I found that it was leaky, reading about $30 \mathrm{k}\Omega$. A replacement restored normal working.

Panasonic NV-FS100/NV-F70

Just as I was beginning to believe in my VCR repair ability along came this all-singing, all-dancing NV-FS100. The dealer said that the power supply would intermittently shut down, though it wouldn't do so for him! So we put the machine on the soak test bench, where it worked perfectly for days, until I left a tape in it overnight. When I came to switch it on next morning, it wouldn't power up. The timer flashed its zeros as normal, but when the operate button was pressed the channel display appeared briefly, the VU meters didn't light up then the machine shut down. This happened three times, until the VU meter lit, the mechanism shuffled and the unit powered up. It then worked perfectly until next morning when the ritual was repeated. After a few days of fruitless early morning checks I realised that with no tape in it the machine seemed to work when first asked. So the fault was evidently in the sophisticated system and servo circuits, to do with the tape

One morning, after my usual fruitless ten minutes' checking the NV-FS100, one of its smaller brothers, an NV-F70, appeared with the comment "no rewind" on the attached label. I cautiously plugged it in, offered it a tape and pressed rewind. The machine powered down and sulkily refused to return my test tape. Though already fairly low, my heart sank. After removing the bottom cover, I wound the tape out. On next inserting the tape I pressed play. So far so good: picture, sound and locked servos. I then tried fast forward. After a few seconds the unit powered down again. Once more to the bottom cover to reclaim my tape.

Now on this more sophisticated version of the G mechanism there's a reel motor which is mounted above the deck mode switch. It's used for the instant jog-shuttle cue/review functions that these machines have. Although the normal capstan driven functions still worked, when the reel motor was called into action the syscon realised that there was a problem and powered down to prevent tape damage. So I disconnected the reel drive plug and applied a small external voltage. The supply spool rotated healthily. Checks were next made around the reel motor drive chip, where a blackened resistor gazed sorrowfully

up at me: R6035 (0.9Ω) was in a state of some distress. Replacing this resistor restored normal operation. But why had it burnt? The unit worked perfectly for a week with R6035 not even getting warm.

On an impulse I stared accusingly at the NV-FS100. Reel drive problems? I lifted the main board and there was R6035, blackened and reading about 5Ω on my meter. Needless to say the correct resistor restored normal operation, even first thing in the morning. Both machines were too new to have had a worn reel motor. Perhaps the motor can be intermittently stalled by the mechanism? Perhaps the reel drive chip can fail intermittently? Does anybody out there know?

Panasonic NV-G25

The symptoms were alarming: there was patterning on E-E, sluggish operation of the drum motor and, when the machine did play back, no colour. The dealer who brought it in said that the luminance/chrominance pack, the head amplifier module and the head drum motor had been changed. After that his technician left, suffering from nervous exhaustion... Fortunately the problem was not as bad as it seemed. C1023 $(1,000\mu\text{F})$, the 14V supply reservoir capacitor in the chopper circuit, was faulty. **B.S.**

Panasonic NV-M1

The request with this vintage camcorder was for an estimate for fitting a new vidicon tube and battery. Out came the dusty old connector to my monitor. On test, the camcorder produced a bright green picture. As it was clear and well focused my attention turned to IC401. It's not uncommon for this chip to fail in these machines – in the NV-M3 it's provided with a heatsink. Replacing this colour-difference matrixing chip produced more normal colours. Quick adjustment of the red/blue gain, electronic focus and beam current controls then produced a good camera picture. A new VWVBM3 battery, still available from Panasonic, completed the repair.

B.S.

Sharp VC400/581/582/583/584

A fault we've had with a number of these machines is that the mechanics go out of sync, producing all sorts of strange symptoms. It's caused by the white plastic cog on the mode switch cracking around the spindle. As a result the cog still turns but the mode switch doesn't move. Thus the machine gets confused. The switch is part no. QSW-R0014GEZZ. It must be fitted exactly as laid down in the manual. The reason for this is that inside the switch there's a 5-to-1 reduction drive. So the cog on the outside turns five times before the switch has turned once. Although the old cam switch can be glued, a replacement is the best solution.

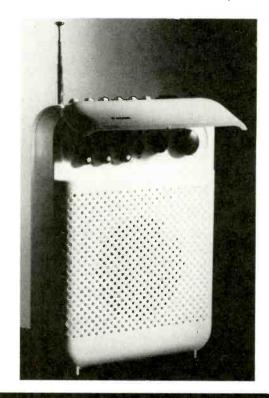
M.Dr.

Ferguson FV32L

This machine came in dead. A quick check showed that the mains fuse F1 was open-circuit. As no fault could be found and the fuse wasn't blackened a replacement was fitted. At switch on the new fuse flashed violently. There was still no readable short-circuit, so the chopper transistor was removed from the board and another new fuse was tried. It again blew straight away. The only likely causes of the fuse blowing were the mains rectifier diodes and the 150μ F, 385V reservoir capacitor CP07. The latter was our first suspect and when it was removed a new fuse held. When

WIN AN FM/MW/LW RADIO

Preset tuned (three f.m., two m.w. and one l.w. station), three-band, mains/battery radio receiver with 600mW output, also 3.5mm earphone socket.



Simply	answer	the	following	questions	by	ticking	the
	iate box.		_		·	Ŭ	

Fifth harmonic LOPT tuning is used

To increase the e.h.t.?

To improve e.h.t. regulation?

The luminance delay line compensates for

The extra processing in the chroma signal path?

The different luminance/chroma channel bandwidths?

Off-tape TV operation calls for

A shorter line sync time-constant?

A longer line sync time-constant?

Readers who send in the first correct sets of answers to be opened will receive the radios. Cut out this panel and send it, or a photostat of it, to:

Television Competition, Reed Business Publishing, Room L323, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.

Print your name and address on a separate sheet.

Radios supplied by Sendz Components

tested on our capacitance meter the old capacitor seemed to be all right, but a replacement cured the fault. The old one must have been flashing over internally when the mains voltage was applied.

M.Dr.

JVC HRD400

A recent case of intermittent record and playback pictures was caused by dry-joints within the luminance module. Although it bristles with surface-mounted components, it's possible, with care, to provide a cure by resoldering. S.L.

Samsung VI510

These are likeable, basic machines. This one was dead with a blown 2.5AT mains fuse. A replacement didn't blow until a cassette was tried in the carriage. As those familiar with these machines will know, the cassette carriage is driven directly by the loading gears, having no separate motor. When turned, the loading motor was found to be very stiff and notchy. It wouldn't operate even from a separate supply. Replacement put matters right. Incidentally, linking pins 1, 2 and 3 of the carriage plug enables the deck to be operated without the hindrance of the carriage.

S.L.

Ferguson FV11R/JVC HRD170

This machine would accept tapes and perform deck functions normally but there was no clock and no timer operation. IC1 (UPD75208CW-097) on the front panel seemed to be a logical place at which to start. Supplies arrive at CN1: the -30V and filament supplies were both

correct. Unswitched 12V was present at pin 1 of CN3 and was being converted to unswitched 5V by IC2 to feed pin 64 of IC1. The reset line at pin 39 of this chip twitched normally at switch on, and the clock oscillator across pins 30 and 31 was o.k. There was little to show by way of data output however, despite various requests being made of the chip. A new chip restored normal operation.

S.L.

Amstrad VC6100/Tashiko VVF934

The lady customer who brought in this machine said there was no playback colour. She also said "my husband thinks it's just a wire off" - that kind of comment can put a tenner on the bill! On test there was just a slight green haze on the playback picture, but the machine's recordings were o.k. when played back on a good machine. After trying all the usual things that cause this fault, i.e. the 4.43MHz crystal, various filters and the HIC101 chroma module, I retired the scope and engaged the meter. A check on the 9V supply at fuse F602 on the power supply produced a reading of 6.5V. This 9V supply goes to several i.c. regulators on the video/chroma board. Disconnecting various lines brought the voltage up slightly, but the fault wasn't being caused by shorts or leakage. What had happened was that some smart person had fitted a 200mA instead of a 500mA fuse in the F602 position. The internal resistance of a 200mA fuse is higher of course, hence the voltage drop. A new 500mA fuse restored playback in living colour. So next time one of these machines comes in with no playback colour, remember that it's not a wire off but probably just a fuse! For those interested in the charge, it was seven times more than that for the lady's comment!!

B.D.

Overhauling Valve Radio Receivers

Stanley Jackson

As time passes there's increased interest in vintage radio receivers, both because of their historical and their antique value. At the same time technology marches on relentlessly, leaving the technology of yesteryear as a specialist subject. The difference between an ancient valve wireless set and the present-day radio is so great that they could have originated on two different planets! A contemporary technician would probably have had a brief look at the theory and construction of valve radios on his way to acquainting himself with modern i.c. technology, but he wouldn't have dwelt on it for long. The purpose of this brief article is to cover the main aspects of servicing a treasured antique wireless: I hope that the advice given will be of some constructive use.

Universal Receivers

Mains-powered vintage radios fall into two categories, a.c. only and a.c./d.c. or universal. We'll deal with the universal type first. With this type of receiver the valve heaters and pilot or dial indicator lamps are wired in series. Thus in the event of the receiver not lighting up, the continuity of the series chain must be checked. Start from the live side of the mains input and continue via the on/off switch, the fuse (where fitted), the mains dropping resistor, the series valve heaters and the pilot lamps, returning via chassis to the second pole of the on/off switch. This assumes that a double-pole switch is used. The switch may be of the single-pole type: in this case the negative side of the mains supply is taken straight to chassis. One item worth mentioning here is the "line-cord" resistor used instead of a mains dropper in some earlier sets, especially of the American portable variety, in order to save space. This line-cord resistor is integral with the mains lead. It often goes open-circuit. You could replace it with a ceramic resistor fitted into the cabinet area, where space for heat dissipation allows. This must of course be of the correct calculated value and wattage. A single-pole on/off switch could be replaced with a double-pole type. Take great care to insulate all screws and fittings that are accessible at the outside of the cabinet and may reach through to a live chassis. Check the continuity of the mains dropper or line cord resistor, the switch, the valve heaters, the pilot lamps and of course the mains power lead itself, which may have corroded with the passage of time.

AC-only Receivers

With a.c. only arrangements the valve heaters and dial lamps are connected in parallel and are fed from a transformer. Thus a "no joy" condition here indicates either an open-circuit mains lead, switch, fuse (where fitted) or mains transformer primary or secondary winding. With a parallel arrangement, if the heater of one valve goes open-circuit the situation will be quite obvious because it will be the only cold valve.

Voltage Checks

Whereas the valves in a parallel system operate at a heater voltage of generally 6.3V, with a series chain the

valve heaters can operate at 12V to 35V or even 50V. The h.t. voltage is much higher, often around 250V, a rectifier valve being used to obtain this supply.

Assuming that all the valve heaters are intact and that the valves are thus warm, the next thing to do is to check that the h.t. voltage is being generated – check at the cathode of the rectifier valve – and that all the valves are receiving their anode and screen grid supplies as appropriate and developing the correct cathode voltage where a bias resistor is included. Absence of anode or screen grid voltages should lead to a check on whatever is between the relevant electrode and the h.t. line. Load resistors can go open-circuit, so can the primary winding of tuned transformers in the mixer and i.f. stages.

Signal Injection Testing

Assuming that the voltages are roughly what you'd expect but there's no sound, signal injection is a simple way of finding the faulty stage. In most sets the i.f. is 465kHz. Thus a modulated 465kHz signal injected at the i.f. amplifier's grid should produce sound from the loudspeaker. A modulated r.f. signal applied to the aerial input and the mixer stages should likewise produce an audio output. If not, there could be a discontinuity in the signal path or the oscillator might not be working.

Common Defects

Apart from dud valves and faults in the heater supply, here are some common defects. The reservoir and smoothing capacitors in the h.t. supply can go open-circuit or low in value, the result being mains hum from the loudspeaker. If they are leaky the h.t. voltage will be low. The two capacitors are often contained in a single can or, in earlier sets, sometimes in a waxed cardboard container. Coupling capacitors in the audio stage(s) can become leaky or open-circuit, causing distortion or loss of signal respectively. Anode load resistors can increase or decrease in value. Where distortion is the problem, particular attention should be paid to the condition of any cathode decoupling capacitors used in the audio stages. They have a habit of going open- or short-circuit. Alternatively, as often happens, the associated cathode bias resistor may have changed value.

Where ancient valves are suspect and replacements are not readily available, the use of a similar valve with a different base can be considered. The best course is to remove the old base and connect up the new one. The values of biasing and other components may need to be adjusted.

The oscillator triode is usually contained within the same valve envelope as the mixer. A valve voltmeter can be used to check it – check for grid current, grid voltage and oscillation at the anode.

Suspect valves should be checked for interelectrode shorts between the appropriate pins, and of course shorted or open-circuit heaters.

A valve's mutual conductance (gain) can be tested by taking a current reading from a meter connected in series with the anode feed components and referring to the valve maker's characteristics data. This assumes that the operating conditions (electrode voltages) are correct.

Cabinets

A word about cabinets. The wooden variety can be cleaned with a little meths to remove heavy deposits of grease, then French polished. Bakelite cases can be cleaned with warm detergent, dried and, where the surface

has lost its sheen, treated with a light coat of clear resin varnish. Metal speaker grilles can be removed and sprayed with a suitable aerosol. Silk mesh is best replaced.

Source of Components

A good source of genuine vintage components is The Vintage Wireless Company Ltd., Tudor House, Cossham Street, Mangotsfield, Bristol BS17 3EN (0272 565 472). Happy renovating!

Letters

WHAT THE PUBLIC WANTS

Every week for the past two-three years we have received calls from the public requesting a service visit to set up equipment that has just been purchased. In addition, many of our customers with whom we've done business over the years have asked us to replace their new VCR/TV set with "something simpler to use". When setting up a machine in someone's home after carrying out a repair it's very common to be asked how to set up the timer, or "what does this button do?". This can happen even when the owner has had the equipment for some time – in some cases years!

On many occasions customers have decided to buy reconditioned rather than new equipment simply because of the operational complexity of the latest machines. They often come out with comments like "I'm not bothered with a 14-event, one-year timer, I just want to be able to playback or record a programme."

Now you might think that being called out to set up modern equipment must be a nice little earner. But consider this. One day the machine might come in for repair. Though of complex design, it didn't cost much to buy. Now over complexity at low price does nothing for the repair trade especially, as is sometimes the case, when the machine turns out to be beyond economic repair simply because the repair bill, though fair, represents too high a percentage of the purchase price.

How many times have you spent ages explaining to a customer how to use the machine after setting it up, only to be told "I doubt whether I'll ever use that facility – it's too complicated"? No wonder that when the cash and carry outfits deliver a sale they just dump it and run!

Manufacturers seem to believe that the only way to compete with each other is to add to their equipment more and yet more high-tech facilities. I believe that they are wrong, and that what the public mostly wants is a nice looking basic machine. One that's "just like the one we had years ago, easy to use but maybe smarter looking".

So my message to the manufacturers is simply this. We know, and the public knows, that you have the technology. But in the main the public isn't interested in how high-tech your machines are. They are more interested in easy-to-use, basic machines, which must be good news to your research teams and costs. There will always be some customers who require everything to be high-tech, but they are a minority and are prepared to pay more. Try an experiment. Commission a street poll to discover what the public wants from its video and TV equipment. I bet the result will make you scrap most of your high-tech research plans. And remember this. Every time that a customer considers a repair to be expensive in comparison with the purchase price, his next purchase will be something

different, usually a different make, "with less to go wrong".

Finally, don't think that we're a struggling service company that's frightened of tomorrow's technology. We service top of the range equipment and are doing fine thank you. My comments above are based on customer feedback, which we should all take seriously all the time. *John Edwards*,

Bromley, Kent.

FERGUSON 3V29/BETA VCRs

With reference to Joe Cieszynski's excellent article on Ferguson 3V29 VCRs in the January issue, I find that there's no need to remove the loading motor when replacing the belt. Release the circlip and push in the spindle by quarter of an inch, making sure that the black thrust washer is retained. The nylon end plate is quite springy and can be prised away slightly to allow the belt to be removed. At this point it's easy to give the pulleys a good scrub with a small toothbrush soaked in methylated spirits. This method is quick and ensures that the alignment of the loading ring remains undisturbed.

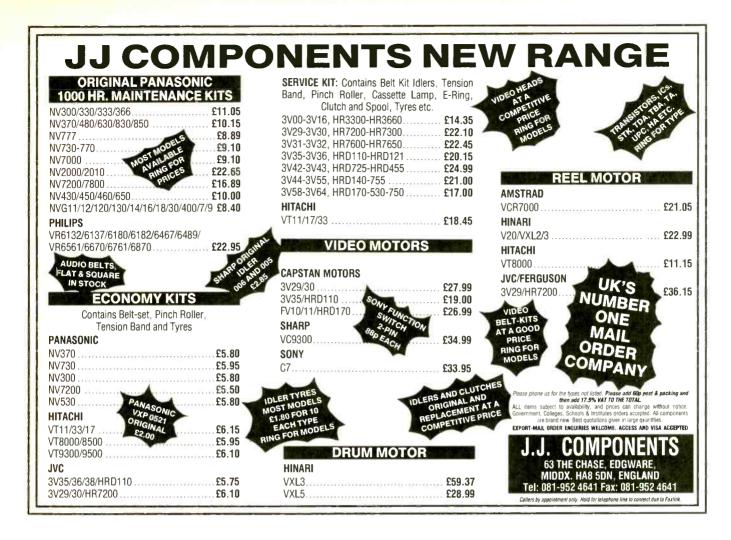
Incidentally, is there a Beta fraternity out there? I have several good Sony machines that give excellent pictures. There must be someone who can write a few articles and give us the benefit of their experience. Any offers? *Pete Hills.*

Wembley, Middx.

SCART INTERFACING PROBLEM

I wonder whether a problem I encountered recently is just run of the mill to those in the trade? I bought a Hitachi VT-F770E VCR that incorporates hi-fi sound and Nicam. At the same time I bought a scart lead to connect the VCR to my Sony KV-X2521U TV set. All was well until I played a prerecorded tape (Fantasia). The sound suffered from terrible ripping distortion at the lower frequencies. The bar-graph indicators on the VCR regularly went into the red.

Being somewhat disappointed, I tried connecting the VCR's audio output to my hi-fi system. The sound was good. So I decided to attenuate the VCR's output by incorporating -6dB networks (see Fig. 1) into the scart lead. This cured the problem. Now according to the specifications the TV set's audio input level at the scart socket is 500mV r.m.s., while for the Hitachi VCR an output of -3.8dBm is quoted. I don't know why Hitachi express it this way. 0dBm is the r.m.s. signal that causes 1mW to be dissipated in a terminating load of 600Ω , i.e. 775mV. A level of 3.8dBm down from this is 500mV. The use of dBm relates to 600Ω line applications, e.g. telephones, and isn't really relevant in the case of a VCR. It's better to express dB levels relative to 1V, i.e. dBV. 500mV is then -6dBV. Anyway, I would have expected the VCR and the TV set to be compatible, since 500mV and



-3.8dBm are the same level.

Because of the modification to the scart lead, the audio level with the VCR's own recordings is lower than that from prerecorded tapes. My conclusion is that the Hitachi VCR was set up to give its specified output at a lower modulation/demodulation level than that used with prerecorded tapes. Nevertheless the results are now good, though I need to turn up the volume a bit when playing the Hitachi VCR's own recordings.

Some readers may recall my article on adding Nicam in the April 1991 issue. Although everything had worked well

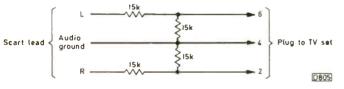


Fig. 1: Added -6dB attenuator networks.

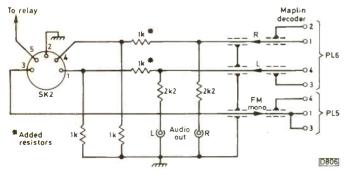


Fig. 2: The same attenuation applied to the Nicam interface circuit – compare with Fig. 1, page 413, April 1991 issue.

for nearly a year, suddenly the TV sound became distorted when there was a sustained bass note. This occurred with Ch. 4 Nicam, and the distortion was much the same as that encountered with the Hitachi VCR. I concluded that the TV set's audio input circuits were intolerant of being overdriven, lacking "headroom". As the Maplin Nicam decoder delivers a 1V r.m.s. audio output I considered it prudent to reduce this by 6dB and modified the circuit of the add-on decoder unit as shown in Fig. 2. Note that the modification – adding two $1k\Omega$ resistors – keeps the output impedance low and doesn't attenuate the phono outputs. After making this change the volume with TV sound and the VCR's own recordings has been brought to the same level.

Thus ends this convoluted story. The sound is now fine, just needing to be turned down with prerecorded tapes. I had thought, perhaps naively, that the scart standard enabled units to be interfaced painlessly. Does it usually work all right, or was I just unfortunate?

Keith Cummins, Holbury, Hants.

EQUIPMENT PERFORMANCE

There have been numerous references in past issues of *Television* to the fact that consumers have difficulty in operating VCRs because of the relatively high-tech way in which the controls have to be interpreted. It seems to me however that the problem of customer education goes deeper than how to operate the equipment: many consumers, and sales assistants, don't seem to know what is correct and what is incorrect performance. A recent experience of mine suggests that customers often accept

incorrect performance with cheaper equipment, even where there's an obvious fault, so long as it doesn't affect their main use of the equipment. Presumably the maxim "you get what you pay for" is assumed as long as the basic functions perform to order.

I attempted to buy a new VCR at the bottom of the high street price range – £200 or thereabouts. My attempt was thwarted because the six machines I tried all had faults that readers of Television would immediately spot and question. I was assured however that customers who had bought these machines had no problems. The first four machines were all Samsung SI1260s. Three had no colour in SP picture search (LP search was o.k.) while noise bars covered 60 per cent of the picture in the pause mode. These are conditions that could possibly be accepted by non-technical customers as being normal, yet the instruction book didn't refer to any loss of colour. The fourth Samsung machine had poor definition with its own recordings. This dismayed the sales assistant, so I turned my attention to two samples of the Hinari HI2V, which is also a two-head, LP/SP model. With both of these machines there were excessive noise bars and no colour in pause. One had noisy drum and reel motors while the other wouldn't function at all in rewind.

The high street multiples involved sympathetically exchanged the machines, and routinely returned my cheque, when they felt that they couldn't help me further. Feeling satisfied with the standard of customer care, I ended my technical frustration by spending an additional £60 in the high street on a JVC HRD540EK. This worked correctly first time, but has no LP mode. Well, you get what you pay for, don't you?

Ray Porter, M.Sc., C.Eng., MIEE, Stourbridge, West Midlands.

LADY ENGINEERS

I read with interest the article (December, page 125) that mentions the lady in the workshop since I'm also a fully qualified engineer, with City and Guilds and qualifications at HNC standard. For the last three years I've won the Sharp Southern Region Junior Technician Award and do all repairs, though I prefer VCRs and camcorders. At the company where I worked two years ago I managed the workshop and trained apprentices. Now I'm at CRS Ltd. as a bench engineer, hoping to specialise in camcorders. I've been an engineer for five years.

Estelle Sandford, Weston-Super-Mare.

GRUNDIG POLICY

In response to John Hopkins' letter (January 1992) on "setmakers' feedback", I must make the point that the policy of manufacturers' service data being provided only to a manufacturer's dealers is absolutely correct. As a manufacturer service, I'm here to support our dealer network which is out there servicing our products and has made a commitment to the brand. Those who don't have an account have made no such commitment and should not therefore expect free service data and technical support.

Non-Grundig dealers can purchase service data from our distributor Willow Vale Electronics as and when they need it. For automated reception of all service data and technical bulletins as released by us, non-Grundig dealers can apply for a Technicover account which carries an annual (1/4 - 31/3) premium of £50 for the data subsequently issued. A Technicover account holder is also

entitled to advice from our Technical Liaison engineers at Rugby. Applicants for a Technicover account should expect a visit from our TLO.

Paul F. Goldring, General Service Manager, Grundig International Ltd., Mill Road, Rugby, Warwickshire CV21 1PR.

BUILT-IN FAULTS

I find that I have coming into the workshop in ever increasing numbers TV sets and VCRs a few years old all with faults created during manufacture. I'm talking about the great big blobs of glue that seem to adorn PCBs old and new. With heat and age this glue seems to carbonise, especially when it has seeped under an i.c. or a heat producing component. The results are amazing, with unusual and illogical faults.

Two VCRs seem to come top of the list of models affected, though they are by no means the only ones. The two are the Sentra 8000 and 8400 and their clones.

The fault on the 8000 is a right weirdo, and to be honest a head-banger when first encountered. The machine just seems to do what it wants. It might accept tapes or it might not. If it accepts a tape it might lace up on its own, it might go into rewind or fast forward, or it could just power down. The machine might have all these faults or just one. The cause is glue under and around the front-load motor and loading motor drive chip IC605. Remove the chip and clean off all the burnt glue. When the chip has been reinserted you'll usually find that the fault has cleared.

The fault with the 8400 is also caused by glue but is of a different nature. The customer complains of tuning drift. Remove IC103 and clean off the glue. Also clean around the following components, Q108, C133, C134, C135, R159, R160 and R161, which form the digital-to-analogue filter for the tuning voltage.

Graham Rees, Walkden, Worsley.

THE MATSUI 1440A

As a regular reader and someone who has served twenty five years in the trade I really must protest at the hamfisted bodgery written up by Donald Bullock. His latest gaff (February) really does it. D508 in the Matsui 1440A is an SR2M avalanche diode that's used to provide protection against excessive h.t. If he uses a BY127 instead he's contravening the safety code of practice.

Andy Norman, Harvies Service, Tonbridge, Kent.

SMOKING SETS

It was about 10 or 11 o'clock on a Sunday night when the phone rang and a voice said "is that the TV man?". Wondering whether it was the football pool letting me know that I'd won the first dividend I eagerly replied that it was. "Well I'm sorry to phone you so late, but my television has caught fire and I didn't know who else to call".

After making sure that the caller had unplugged the TV set and that no smoke remained, also that the caller didn't want me to take the set away that night, I arranged to make it the first call in the morning. That night my mind went back to the occasions in the past when this sort of thing had happened. There was the Pye 169 back in the Seventies that had caught fire and melted the tube, the Philips G9 sets with the capacitors that exploded on the

line timebase panel and, come to think of it, the ITT CVC5s that used to smoke a lot from the front panel. So I think I worried more that night than the customer.

First thing in the morning I was waiting outside the customer's house with the cat and the milkman. On entering I found that the TV set was in one of those large cabinets that were made for traditional sets before the FST and black became fashionable. I was told that the set had started to smoke from the right-hand side at the back, while London's burning was on! After saying that this model was not designed to watch London's burning and that it was probably the special effects, I was told "it's lucky then that I wasn't watching Rawhide, isn't it?". I know when I'm beaten, so I heaved the 26in. Philips K30 back to the shop.

With the set on the bench I removed the back and discovered, well nothing really. Just the usual dust and slight discolouration, but nothing that differed from many other sets of the same age. When I switched on the picture appeared. Field, line, colour, brightness, contrast and sound were all o.k. What to do next? Well even if we do live in Suffolk not all our customers are silly. So I cleaned the dust off the circuit boards, paying particular attention to the capacitors in the line output stage and the power supply. While doing this I found that C6291 had a small dark hole in it. The quick-thinking customer had made it more difficult for me by switching off before the smoke and burning made my job too easy.

So, all you readers, remember the CVC5 and the old monochrome sets, because this is the same old faulty filter capacitor across the mains switch. It might be coming back as a stock fault.

John Hopkins, Felixstowe, Suffolk.

HELP WANTED

We are trying to restore a Bush TV22 TV set and require the following: a line output transformer; an on/off/volume knob; a photostat of the circuit diagram. If anyone can help, please phone or write with price etc. to Steve Westell, Westacre, Whiteacre Lane, Whalley, Blackburn BB6 9BJ. Telephone 0254 822 222.

Could anyone supply a quantity of Labgear Televerta CM6022 mains-operated v.h.f./u.h.f. converters with preamplifier gain, or an equivalent? G.H. Jones, Einion Electrics, Bridge Street, Llanfair Caereinion, Powys SY21 0RZ. Telephone 0938 810 539.

I have a Condor VCR8120 whose sweep tuning won't stop at stations. It's a VHS machine produced by Daewoo who are unable to help. Apparently there are equivalents in the Alba and Goodmans ranges. I'm unable to obtain the DMB5210VP chip which may be responsible. Can anyone help? M.B. Wilson, 1 Playwell Court, Glanton Alnwick, Northumberland NE66 4BL. Telephone 0665 78 437.

Can anyone supply, new or secondhand, a 10C1 valve which I require to restore an old Murphy radio? G. Upton, 10 Sycamore Close, Springfield Grange, Hull HU5 5FO. Telephone 0482 565 744.

Can anyone supply a service manual for the Hitachi Model VK-C800 colour video camera? All expenses would be met. G. Truelove, 42 Artillery Road, Guildford, Surrey GU1 4NW. Telephone 0483 505 134.

next month in

TELEVISION

• THE FERGUSON TX80 CHASSIS

The recently introduced Ferguson TX80 chassis used in small-screen colour portables could be the last incigenous UK TV design. While showing some Thomson influence, its Enfield origins are stamped plainly on it. This is particularly the case with the combined chopper/line output circuit that recalls the Syclops system used in the 9000 series chassis. The design is not old hat however: in fact it's full of innovation. There are microcomputer remote control, on-screen graphics with a simple menu system to make adjustment of the controls easy, a sleep timer and a child-lock facility. Considerable integration is present in the low-level stages, where a single l.s.i. chip combines the i.f. section (sound and vision), the PAL colour decoder and the timebase generators. J. LeJeune describes the operation of the circuitry.

SOLDER AND FLUX

Soldering is a basic, everyday job. Probably most people give it little thought. All you need is a reel of flux-cored solder, a hot clean iron and the sense to apply them properly. That may have been the case at one time, but the demands of today's electronics have changed matters considerably. What about metals other than copper, the needs of hot-running components, satellite TV waveguides and surface-mounted assemblies? They all have different requirements, which means that there's a lot to know about solder and fluxes, their forms, applications and properties. Eugene Trundle has carried out a thorough investigation of the latest developments. Next month's feature on the subject includes a glossary that explains some of the specialist jargon in use.

● AC/DC HIGH-VOLTAGE TESTER

Microwave ovens are appearing on the workbench in ever-increasing numbers as their popularity and age increases. Faced with an oven whose light is on and the fan runs but nothing heats it would be nice to be able to check the high-voltage supplies. Ian Rees has devised a simple probe with a calibrated control and neons to do just that. Easy to build and a great time saver.

• FAULT GUIDE TO THE FERGUSON 3V38

John Coombes provides a fault run-down on the Ferguson 3V38 and associated VCRs — the 3V39, JVC HRD110, Toshiba V55 etc.

PLUS ALL THE REGULAR FEATURES

ORDER YOUR COPY ON THE FORM BELOW

				(Name of *	Newsagent)
Please of TELE 18th, and notice.	VISION	(£1·95)	, on	sale	March
NAME					
ADDRESS			,		
***************************************		•••••	•••••		

Satellite Notebook

Nick Beer

Due to my colleagues' alleged aversion to heights and lack of technical knowledge I find that I've been attending to a lot of satellite TV service calls, especially when an outside fault is suspected. I don't mind: it gets me out of the workshop and I get a breath of fresh air. The reliability of satellite TV systems seems to vary tremendously depending on which dealer has carried out the installation, even when the equipment is the same. This can of course be attributed mainly to installation standards. Anyway, some recent experiences may be of interest.

Ferguson SAP4 System

The Ferguson SAP4 system comprises the excellent Pace made SRV1 integrated receiver-decoder (IRD), a mesh dish and compact Marconi LNB. Since Ferguson has dropped the SRV1 but not the appalling SRD4 we have to obtain the original Pace unit from elsewhere.

We've had a number of cases of sparklies with these systems. The performance of the SRV1 is, here in North Devon at any rate, much better in this respect than that of the SRD4 – in fact the difference is so great that we won't stock the latter. The complaints we've had have arisen some time after the original installation, the performance to start with being perfect. Initially I found that resetting the i.f. offset cured the problem and assumed that either the installer didn't set it or did so with a cold LNB – weight was added to this view when one installer admitted to this practice. Further calls have however had to be made to a few installations, and the cause of the problem has now definitely been identified as low output from the LNB (don't confuse it with lack of signal). To cure the problem Ferguson has introduced a higher-gain LNB – a gold spot identifies it.

I had one case where the output from one of these LNBs disappeared completely. It occurred one night when there was a very sharp frost, though whether this had anything to do with it I won't venture to guess.

Multi Systems

We've had several enquiries about running one or more extra receivers from an existing dish. When customers realise that more is involved than running a lead to the bedroom they usually settle for an r.f. feed to a second set. Others may use a second receiver with a split i.f. feed. In this case there's a polarity restriction, but at least there's a limited choice of channels. You can do this at a reasonable cost – Labgear for example can supply good i.f. splitters/combiners at a very reasonable cost.

An Interesting Installation

An interesting installation we carried out recently involved two neighbouring cottages that were both owned by the same businessman. One cottage already had a 60cm mesh dish that was being used with a Ferguson SRV1 receiver. Because of planning restrictions it was not possible to install two dishes. So a dual-output LNB with a global switch was required. We discovered that the Protel dual-

output LNB can be mounted on the black mesh dish fairly easily despite the fact that it needs an MTI type mount, which means that its viewing angle is completely wrong – unless you invert the arm so that the kink looks down instead of up. Things work pretty well when this is done. An MTI mount can be obtained from those cheap Amstrad dish kits that come with several clamps.

That's how we did this job, but our installer hit a problem. One receiver wouldn't control its own polarity. When I called to check it out I found that the global switch had had to be installed in a loft to which the only access was through a two-foot square hole in a wall with a water pipe running right across the middle! Fortunately the cause of the problem wasn't here. In the cottage affected a Georgian brass coaxial outlet was used for the i.f. connection. It was isolated of course.

Ferguson SRV1 IRD

The only stock fault we've had with the Ferguson SRV1 has been a decoding or vision problem – typically no vision on a decoded channel or no decoding (with the on-screen graphics missing). The usual cause is tarnished pins on the Videocrypt PCB connector – clean the pins and socket thoroughly. I've even had the problem with brand new units. It's a fairly crude connector and I think that things would have been done rather differently – a ribbon for example – if a traditional brown goods manufacturer had been responsible for the design.

From the servicing point of view the unit is superb, with the Videocrypt PCB entirely separate and plugged. All the connections to the receiver, across the back, are standard with plugs/sockets – this is even the case with the mains lead. So collecting a set and supplying a loan is a peach should it be necessary.

Patterning

One widespread problem we've had with Videocrypt decoders, whether in separate or IRD form, has been patterning due to radiation. With the original hump-back unit we've had complaints ranging from severe patterning to complete obliteration of the u.h.f. channels in the range 30-35. Quite a few customers in our area have been involved – there are several group A and B relay transmitters on our patch, and Channel 4 from the main Caradon Hill transmitter is on channel 32. The effects have varied with signal strength and decoder proximity to the incoming u.h.f. signals.

We took the matter up with Ferguson's Regional Technical Manager Bernie Hinton, who said he'd had great success in curing such problems by using twin screened coaxial in place of all coaxial leads and keeping them as short as possible. Whether we should get involved with such problems was at the time debatable, since the units that caused the trouble were being rented from Sky direct. A couple of cases did however prove that Bernie's approach was very effective.

The problem has altered slightly with the introduction of IRDs – it now occurs on various channels across the band, in particular on channel 55 which is used by BBC-1 from the main Huntshaw Cross transmitter. Since we supplied these units ourselves we got busy and solved all the problems with twin screened leads. When you consider the standard of the coaxial lead actually supplied with the IRDs it's no wonder that radiation occurs.

Radio Rentals have put out a fair number of these IRDs in our area and have experienced the same problems.

More on the Finlux 1000 Series Chassis

Chris Watton

The Finlux 1000 series chassis was introduced in 1985 and has proved to be very reliable. Tube life is good, and large numbers of these sets are still going strong. There are stereo versions and teletext comes in various different forms such as basic text and one-page or two-page memory – all have colour inversion capability.

There's an efficient TDA4600-type chopper power supply. Tuning is of the frequency synthesis type. The sound quality is good, with panoramic distribution – split between the two speakers. Stereo models can use satellite TV or a stereo video tape as a source or the set can be used in the audio only mode with a suitable input from, for example, a tape deck connected via the scart socket to facilitate use of the remote-controlled audio amplifier.

therefore be used with RGB signals from BSB equipment

In a recent article (December 1991) Steve Cannon dealt with common faults. The present article describes our approach to tackling a faulty set. One thing to note is that the set will switch off after five minutes when it's operated without an input signal.

There are full connections to the scart socket, which can

The Power Supply

The logical thing to start with is the chopper power supply. This is the test order I follow, after checking the on/off switch, which is of a type used in many Continental sets and is made by Preh. This switch is responsible for a fair share of failures. If the switch is o.k. and the fuses are intact I put the meter clip on the TDA4600 chip's heatsink and check for 320V at the bridge rectifier's output. Next I check the voltage at the TDA4600 (actually type TDA4600-2D) chip's l.t. supply input pin 9. The voltage here should be at least 9V. If it's low, check the four $2.7k\Omega$ resistors (Ru3/4/6/7) and the posistor (PTCu2) in the startup circuit. If the voltage at pin 9 is high, above about 20V, you can be sure that the chip is open-circuit. In addition to a new chip replace the two resistors (Ru22 150k Ω and Ru21 120k Ω) in the charging circuit, connected to pin 4 of the chip, even if they test all right. Otherwise you'll probably be replacing the chip again soon, along with the chopper transistor. This is prudent with any TDA4600type circuit - sometimes there's a single resistor with a value of around $270k\Omega$. The voltage at pin 9 of the TDA4600-2D chip should be 13V, but 9-10V will get it started. If necessary then check at pin 1, where the voltage should be 4.3V. If the reading is very low, Cu4 $(100\mu F)$ is probably short-circuit.

In my experience the electrolytics are the most common cause of faults in the primary side of the power supply. In order of likelihood, check Cu1 (100μ F, 35V) which couples the drive to the base of the chopper transistor, Cu2 (100μ F, 35V) which is the l.t. supply reservoir capacitor, Cu4 (100μ F, 16V) which is the reference voltage smoothing capacitor and Cu8 (1μ F, 63V) which smooths the negative feedback voltage. I've never had a diode in the primary side of the supply fail. They probably do however, as with other makes that use this type of power supply it's usually the diodes rather than the electrolytics that fail.

The secondary side of the power supply is a simple

affair, consisting of four rectifiers and their associated components. The most common fault here is failure of the BY299 138V h.t. rectifier Du18, giving the dead set symptom. I like to check this by connecting the meter on the ohms range between chassis and Du18's cathode: if the resistance reading is less than 1 Ω the diode is short-circuit; if the resistance is 1.5Ω or slightly higher the BU508A line output transistor Tz4 is short-circuit. Failure of either item produces the same symptom. Use voltage or resistance tests to check the other diodes and safety resistors as necessary.

Line Timebase

We'll consider the line output stage next. This uses a diode-split line output transformer with the focus and first anode supplies built in. As mentioned above, the line output transistor can fail. It usually does so for a reason. As with so many sets the reason is good old Mr. Dry-joint. You can find dry-joints at the line output and chopper transformers, the scan coils plug and the chopper and line output transistors. So a good solder up is called for when working in this area.

Line output transformer failure is not common. Sometimes the first anode control goes high-resistance however. Thus the tube's first anode voltage rises. The picture goes bright and the set trips. You may suspect a fault in the video section, but what is usually happening is that the first anode voltage is varying so much that the auto grey-scale system goes crazy in an attempt to keep up with the rapidly changing tube current. When the first anode voltage rises above a certain point the power supply trips due to the excessive beam current.

The scan coils plug modification in the 1000/2000 series chassis was mentioned by Steve. You solder two rivet-shaped sleeves to the pins that carry the line scan current. The reason for this is that they get hot and the solder joints deteriorate. The plug's internal contacts can deteriorate however, and I think that's why they get hot. When this trouble arises it will soon be time for a new line output transistor. The customer will probably complain about e.h.t. flashing, or line tearing at least, before the transistor fails. Removing the plug and soldering the wires direct to the panel takes a bit of beating as a cure for this trouble.

A couple of other faults in this area are not uncommon. First the BC637 line driver transistor Tz3 can go open- or short-circuit. Secondly either of its two 15Ω feed resistors Ru42 and Ru43 can go open-circuit for no apparent reason. A clue to the no line drive fault is that when switched on the set will come on with channel one and there will be a faint hum at about 200Hz from the speakers. On more than one occasion I've found that the line output transistor was open-circuit.

Tube Base Panel

There are only a few components on the tube's base panel. The only trouble we've had here relates to the wiring to the other two panels. There are two ribbon cables. One has five wires of which only three are connected. It comes from the signals panel and can be responsible for intermittent loss of one or more colours. The other cable comes from

the power/line scan panel. It can be responsible for the same symptoms as when the first anode control goes high-resistance, i.e. the brightness increases and the set trips. So don't get caught out here. It can be embarrassing if you replace the line output transformer when all that's wrong is a wire off. Where have I heard that before? — but in this case it can be true. The wire actually breaks, but you can't see this as the other wires hold the thing in place.

Field Timebase and EW Modulator

A TDA3652 chip, ICk1, is used in the field output stage. It's powered by the line output transformer derived 26.5V line which also feeds the EW modulator drive circuit and the field hold control. The first problem here is that you'll seldom see a field fault as the sandcastle pulse that's fed to the colour decoder chip will be incorrect. You can easily overcome this problem by connecting an Avometer on the 250V range between any of the RGB outputs and chassis. You will then usually see a faint single line in the relevant colour. As an alternative you could turn up the first anode control setting to get some brightness, but the control will have to be reset properly, which calls for the use of a scope, so it's best left alone.

In the event of field collapse the first check should be for 26.5V at the junction of the two parallel-connected 1Ω surge-limiting resistors Ru11/12 and the $2,200\mu\text{F}$, 35V reservoir capacitor Cz7. These items are just to the right of the line output transformer. Like other safety resistors, Ru11/12 can fail for no apparent reason. Often however the field output chip fails. When this has to be replaced I also change the supply decoupler Ck4 ($470\mu\text{F}$, 35V) for good measure.

The EW modulator is very reliable. I've not had a single fault in this area – not even a dirty control.

Signal Circuits

The signals panel is on the left-hand side. It contains some more power supply circuitry, the RGB output stages, the audio, colour decoder and i.f. sections and the frequency synthesizer. There are subpanels for teletext and panoramic sound, and one or two spare sockets for things like SECAM etc.

The tuner unit has the aerial socket fixed to it directly (no need for isolators with this type of power supply). It's soldered into the PCB. I had my reservations about this originally, but the whole thing is much stronger than it looks. It's a different matter inside the tuner however. The green PCB seems to come adrift with ease where it fastens to the frame of the can and the earthing struts. A good hot iron and a steady hand (I've got neither...) will soon put matters right. The usual faults caused by the tuner are one or two channels missing or the picture going off with the slightest tap on the set.

The only faults I've had in the tuner control system have been caused by the SDA2112 chip ICt1. In one case there was no tuning voltage output at pin 11. The other fault was intermittent no tuning when hot – a shot of freezer confirmed that the chip was responsible.

From the tuner the i.f. signal passes via the BF959 driver transistor Ti1 to the dual-output SAW filter Fi1. The sound and vision signals then follow separate paths. Signal separation at this early stage removes any possibility of vision buzz. The vision i.f. section is contained in ICi1, which may be a TDA4443 or a TDA3541 depending on chassis version. The output goes to the TEA2014 video switching chip ICi3, which is controlled by the microcom-

puter chip ICt2. When the AV mode is selected external video from the scart socket is routed through to the output pin 6. The video path is then via the teletext panel to the colour decoder. The arrangements vary here, later versions incorporating a colour transient improvement chip. Faults in this area are fortunately very few and are usually caused by incorrect sandcastle pulses or cracked print. The usual fault is no picture. The video signal and the brightness, contrast and colour control voltages all seem to be right but there are no outputs from the colour decoder chip. Any discrepancy in the sandcastle pulse will cut off the video. It's always worth checking the video input however as text faults in sets with a teletext panel can cause no picture in the TV mode.

The main fault on the teletext panel is dry-joints. The panel has print on both sides, the component side being connected to chassis. There are pins that go through the panel to connect various parts of the circuit to the other side. Different versions of the text panel have a different number of pins. They look like test points but they aren't. Most faults can be cured by ensuring that the pins are soldered on both sides of the panel. Poor joints can cause all sorts of faults, such as intermittent loss of picture, no text, some text lines appearing on the normal picture, and chessboard effects.

Here are some faults we've had on the signals panel. Tb1 (BC557B) being leaky will remove the raster. Failure of Da1 (1N4007) will remove the raster or switch the set to standby. Similar faults can be caused by Ta8 (TIP41), which can also make the colour vary and trip the set. When you look at the print side of the panel you'll see that various bits of the print have been cut. This is done to cater for various options. The problem is that in carrying out the cuts adjacent tracks are sometimes caught. The set can work normally but eventually tiny cracks appear. This can cause some strange faults such as the local controls not working correctly or, when text is selected, the channels change as you try to key in a page. These problems occur around the microcomputer chip at the bottom. A manmade fault can occur at the top of the panel: the chrominance delay line can become dry-jointed when the board is hinged out, or the delicate print can crack if the delay line is grasped when the board is opened. On one occasion a resistor shorted to the body of the tuner, shorting the 5V line to chassis. As a result the power supply started up without the momentary switch on (from the mains switch) or a remote control signal. The symptoms were no picture and no channel display.

Miscellaneous Points

The chassis is not too good to work on as the leads always seem to be about an inch too short. If the bottom panel has to be withdrawn to the service position, the speaker sockets on the plastic frame have to be unplugged. If they are pulled very much they will come off the speakers within the enclosures. Thus when you've repaired a power supply fault you may think that there's a sound fault. So check the speaker leads. When the bottom panel is out of the set the mains switch is easily caught and the set can come on. Beware of this — unplug from the mains if the panel is propped up.

Lastly the remote control unit, which also gives trouble occasionally. Sometimes the chip packs up or the resonator breaks away from the panel. The most common fault however is that the $1,000\mu F$ capacitor falls out. As a result the unit will be capable of only very short-range operation or won't work at all.

Trade customers can obtain spares and technical help from Lohja UK Ltd., Valley Farm Way, Stourton, Leeds LS10 1SE. Telephone 0532 716 311, fax 0532 706 622.

TEST CASE

351

Each month we provide an interesting case of TV/video servicing to exercise your ingenuity. These are not trick questions but are based on actual practical faults.

There have been few truly British TV chassis designs in the last few years. The Ferguson TX98 and TX99 chassis are amongst the few. In terms of performance and reliability they have proved to be good, but this is not to say that they never go wrong. Sherlock had a TX99 on his bench recently. Its fault took him rather longer than it should to resolve. Could you have dealt with it quicker?

The set was a Model 51J8, which is a 20in. monitor-style set with remote control. Its problem was excessive brightness, with the brightness control having very little effect. In all other respects the picture was fine: the focus, colour and scan amplitudes were all correct. The sound too was present, correct and controllable. Not a difficult one to sort out Sherlock thought as he removed the back cover. At least the fault was a permanent one, unlike those in the soak-testing sets on the shelves that surrounded him.

He made a start by checking the tube's first anode voltage. The adjustment potentiometer on the line output transformer assembly was set at about half way. Turning it down reduced the picture's brightness, but the picture didn't look "right" and the user brightness control still had a relatively small control range. Sherlock reset the first anode preset for 830V at pin 7 of the tube, having consulted the manual for the correct voltage. The potentiometer was back where it had started. Time to look at the tube's cathode voltages then. They should be at around 116V, but were all under 100V. This would explain the excessive brightness. Since the RGB output stages have separate inputs and outputs, Sherlock reasoned that the cause of the problem must be associated with the TDA3301B colour decoder chip IC3.

The brightness level is set by the voltage applied to pin 30 of this chip. According to the circuit diagram, the normal range here is 0.8-3.6V. In fact a variation of 1-3.72V was measured as the user brightness control was taken from one extreme to the other, the switch-on/reset level being 2.17V. This seemed right enough to Sherlock, who saw no reason to investigate further the various items in the brightness control circuit. Could the voltage at the tube's control grid have wandered? No, pin 5 was at 0V and the only item here, the flashover protection resistor R228, was intact. Could the heater or the e.h.t. voltage be

too high? Again no – the heaters glowed normally, and the h.t. voltage at the smoothing capacitor C104 in the power supply was about right at 112V.

Advice was sought around the workshop. Television Ted suggested that the l.t. voltage should be checked, pointing out that it's critical. Sherlock confirmed that the voltage at pins 39 and 40 of the colour decoder chip was 11.7V, as specified, and that the 12V supply was correct at the tube's base panel. Low video h.t. voltage could have been responsible, but there was 180V at pin 3 of PL11 on the tube's base panel. As no more ideas were forthcoming from the workshop fraternity Sherlock decided to replace the TDA3301B chip. When he'd fitted the replacement he found that it had no effect whatsoever on the fault! Sherlock had been assuming that the cause of the problem was excessive voltage at the RGB output pins (14, 17 and 20) of the colour decoder chip. He figured that this would result in excessive current flow in the RGB output transistors, thus pulling down the c.r.t.'s cathode voltages. When he finally got round to checking the RGB outputs from IC3 – they should normally sit at around 5.5V – he was surprised to find them on the low side. It took him a while to grasp the significance of this, but once the penny had dropped the cause of the fault was soon found. What was causing the trouble? What had Sherlock missed during his initial diagnostic checks? See next month for the answer and another test case item.

ANSWER TO TEST CASE 350 – page 282 last month –

When a highly intelligent microcontroller chip is combined with a very complex collection of mechanics and something goes wrong, you need a highly intelligent technician to sort things out. Normally Sage is one of our best men, but he came to the brink of defeat when confronted with an oscillating VCR deck mechanism in a six year old Mitsubishi machine that masqueraded as a Luxor model. Poor Sage!

Within a VCR a closed loop is formed by the mode switch, the loading motor and the microcontroller chip in the mechacon department, the deck's mechanics being controlled by the inputs to this chip and the program in its ROM. Such diverse things as drive chips, plastic cogs, plugs and print tracks all form part of the loop. When the loop is complete and the setting of the mode switch agrees with the physical positions of the sliders, levers and cams, the mechanism behaves itself. All these things had been checked by Sage in his attempt to diagnose the cause of the oscillation – well, almost all.

The mode switch has four connections, /P0, /P1, /P2 and /P3, which are linked to the main PCB via plug/socket MM. They go to pins 45-8 of the microcontroller chip IC5A0. Further investigation showed that the /P3 print from MM12 to pin 45 of this chip was open-circuit due to a hair-line crack at the front right-hand side of the PCB. The crack was buried beneath a jumble of glue and components added as factory modifications. Yes, Sage should have discovered it sooner but who, hand on heart, could say that they would have gone straight to it?

Published on the third Wednesday of each month by Reed Business Publishing Ltd., Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Filmsetting by Trutape Setting Systems, 220-228 Northdown Road, Margate, Kent. Printed in England by the Riverside Press Ltd., St Ives plc. Distributed by IPC Marketforce, Kings Reach Tower, Stamford Street, London SE1 9LS (071 261 5000). Sole Agents for Australia and New Zealand — Gordon and Gotch (A/sia) Ltd; South Africa — Central News Agency Ltd. "Television" is sold subject to the following conditions, namely that it shall not, without the written consent of the Publishers first having been given, be lent, resold, hired out or otherwise disposed by way of Trade at more than the recommended selling price shown on the cover, excluding Eire where the selling price is subject to currency exchange fluctuations and VAT, and that it shall not be lent, resold, hired or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever. ISSN 0032-647X.

ELECTRONICS

Ferguson TX Handsets	£8.80p £7.46p
A56.540X CRT 51cm FST from	
Ferguson LOPT (TX100) Original Ferguson 3V29 Belt Kits (Pack of 10) Sharp Idlers (5 Large + 5 Small) Amstrad Mod. Kit (Pack of 5) Ferguson Carriage (Original)	£7.50p £10.50p £15.50p



Cheque with Orders Major Credit Cards Accepted

BARCLAYCARD

All prices include delivery, but exclude VAT Stock items despatched within 48 hours

VISTA ELECTRONICS

Unit 1B, Wingate Grange Industrial Estate, County Durham, TS28 5AH Fax: 0429 837101

Tel: 0429 837100

AUDIO VISION (UK) LTD

BRAND NAMED ELECTRICAL GOODS

CATALOGUE RETURNS/B.E.R./GRADED/VIRGIN STOCK AT UNBEATABLE PRICES

Full size midi system from Full size midi system with C.D. from	
14" TV & VCR from	£30.00
Stereo Twintape from	£5.00
Walkman from	£1.00
Keyboards from	£3.00
Portable TV from	£30.00
Flat bed cassette from	£1.50

MANY LINES OF GRADED STOCK TO INCLUDE **HOUSEHOLD ELECTRICAL & CAR AUDIO**

UNIT 3. CROFT COURT. KIRK SANDALL IND. EST., **DONCASTER DN3 1QR** PHONE (0302) 890984/5 PLEASE PHONE JOHN McKENDRICK

NEW 1992 CATALOGUE



SEND NOW FOR THE

ELECTRONICS LTD

COMPONENT CATALOGUE. ONE OF THE BEST RANGES AVAILABLE

NAME COPIES OF CRICKLEWOOD PLEASE SEND ELECTRONICS CATALOGUE (Free to Bona Fide Engineers & Trade or Telephone for Free Catalogue).

CRICKLEWOOD ELECTRONICS LTD, 40 CRICKLEWOOD BROADWAY LONDON NW2 3ET. TEL 081 450 0995, 081 452 0161 FAX 081 208 1441 TRADE ONLY

MICROWAVE OVEN **PARTS**

MAGNETRONS · DIODES · TRANSFORMERS LAMPS · FUSES · MICROSWITCHES

PHONE NOW FOR PRICE LIST

A.W.I. MICROWAVE OVEN COMPONENTS Samuel Whites Estate, Medina Road, Cowes, Isle of Wight PO31 7LP Telephone: 0983 296121

Fax: 0983 296122

ALL TYPES OF USED TV AND VIDEO SPARES, PANELS, CABINET **FRONTS**

DISCOUNT FOR EXCHANGE UNITS WORKING CHASSIS ALSO AVAILABLE

DON'T WONDER, JUST PHONE AND ASK 0843 850040

Antex Temperature Controlled Irons ... keep down the cost of soldering.

An economic range of soldering irons for the small to medium sizes assembly lines. Apart from the low cost, Antex Temperature Controlled soldering irons offer so much more. For instance, the Antex A545 controls temperature electronically, not by magnetism or changing bits. Simple Temperature selection is in the handle. Although an Antex U500 power supply is Temperature available. Antex A545 Irons can be used with any 24V 50 watt supply. Adjustment in handle Antex irons are also earthed for extra safety. Antex also supply 'Soldip' Solder Pots in 2 sizes.

Sat 10 am to 12 noon

Available from leading electronic distributors or send for details of the whole Antex range.

Antex Electronics 2 Westbridge Industrial Estate, Tavistock, Devon PL19 8DE Telephone: (0822) 613565 Fax: (0822) 617598

TV LINE OUTPUT TRANSFORMERS PHONE 081-948 3702 FAX: 081-332 0583

ALBA . AMSTRAD . BUSH . DECCA . DORIC . ETRON FERGUSON . FIDELITY . GEC . GRUNDIG . GRANADA HITACHI . HINARI . INDESIT . ITT . KIMARA . NIKKAI . MATSUI . MURPHY . OSAKI . NORDMENDE . LOEWE-OPTA. REDIFFUSION PYE. PHILIPS . SANYO . SAISHO . SHARP . SONY . SOLOVOX . SUSUMU . TANDBURG . TELEFUNKEN THORN . TRIUMPH . HUANYU . GOLDSTAR . BINATONE

> COMPUTER MONTTOR TRANSFORMERS STOCKED CALLERS WELCOME AT SHOP

TIDMAN MAIL ORDER LTD . 236 SANDYCOMBE ROAD . Mon-Fri 9 am to 12.30 pm & 1.30-4.30 pm RICHMOND . SURREY . TW9 2EQ.

Approx. 1 mile from Kew Bridge.

JVC HEADS £15 RANGE OF NEW HANDSETS

(3 miles from M4, Junction 25)

MEAN DEFINED FAFT	I WELK
COLOUR TV	
PIL	FROM £15 WORKING
R/C	FROM £28 WORKING
TEXT	FROM £40 WORKING

PORTABLE FROM £50 WORKING VIDEO'S

FROM £45 UNTESTED

ALL PRICES INCLUSIVE OF VAT Units 11 & 12 Taverner Estate, Caerleon, Newport, Gwent

Ring BOB on 0633 430040

MAKE YOUR INTERESTS PAY!

Train at home for one of these Career Opportunities

Over the past 100 years more than 10 million students throughout the world have found it worth their while! An ICS home-study course can help you get a better job, make more money and have more fun out of life! ICS has over 100 years experience in homestudy courses and is the largest correspondence school in the world. You learn at your own pace, when and where you want under the guidance of expert 'personal' tutors. Find out how we can help YOU. Post or phone today for FREE INFORMATION on the course of your choice. (Tick one box only!)

Electronics		TV, Video & Hi-Fi Servicing					
Basic Electronic Engineering (City & Guilds)		Refrigeration & Air Conditioning					
Electrical Engineering		Car Mechanics					
Elec. Contracting/ Installation		Computer Programming					
GCSE/GCE/SCE over 40 examination subjects to choose from							
Name:							
Address:							
P. Code							
International Correspondence Schools, Dept. EGS32 312/314 High Street, Sutton, Surrey SM1 1PR. or 041-221 7373 (24 hours)							



REDUCE

Join the thousands of companies who have increased their profits by adding the credibility of the Guild of Master Craftsmen to their sales message; and reduced their costs by taking part in the Guild's many money-saving schemes. For full information:

CALL (24 hours a day) FREEPHONE 0800 525285

Or send for details to: The Secretary, The Guild of Master Craftsmen, 166 High Street, Lewes, East Sussex BN7 1XU

Company Name	
Address	
Postcode Tel. No.	
Craft/Trade	
Number of Employees	

HOCKLEY DISCOUNT TELEVISIONS

THIS MONTH'S SPECIAL OFFERS — BUY NOW — T.V. REMOTE CONTROLS

FERGUSON TX10

Only Et HOUSING

VIDEO HEADS

STAR FERGUSON TX10
TELFTEYT

Only £16.95

E180 V.H.S. VIDEO TAPES — ONLY 950

SEMECHALITY ALLOW INTERPRETATION ALLOW INTERPRETATI



R.F. FLYLEADS Y-SPLITTERS

ONLY 28p ONLY 45p

ALSO \rightarrow NOW IN STOCK 'B' GRADE

WALKMANS, MIDI-SYSTEMS, RADIO/CASSETTE RECORDERS, ANSWERING MACHINES, TELEPHONES, KETTLES, JUGS AND COMPLETE RANGE OF TELEVISIONS AND VIDEOS

> ★ PLUS MANY MORE!! 'BRAND NEW' PRODUCTS ARRIVING DAILY

OFFINE HOURS NON THE TOUR W. H. MARIN AN HUNS

GIVE JAZZ A BUZZ ON 021-515-2003

140 Hockley Hill, Hockley, Birmingham B18 5AN Tel: 021-515 2003

Fax: 021-515 2004





How to design your own satellite TV system and get it right ...



... with the SATMASTER program by D I Stephenson, you can!

IBM PC compatible with MS DOS 3.0 or higher

- · Design your own system and test its performance before you install it!
- Quickly find essential dish setup angles: elevation, azimuth, polarisation offset for any satellite from any location in the World!
- · Easy-to-use pop-up menu interface makes tedious tasks simple for everyone!
- · Complete with User Manual!
- · 20,000 word on-screen technical guide and context-sensitive help!
- · Calculates full link budget including dish size optimisation ensures the best quality picture!
- · Plot beamwidths and lobe patterns and judge potential interference from neighbouring satellites!
- · Results and graphs can be output to screen or printer!

Take out the guesswork ... order SATMASTER today.

Swift Television Publications

17 Pittsfield, Cricklade, Swindon SN6 6AN Tel or Fax 0793 750620

program(s) (3.5" disk) @ £35 each, postage	Name:
l enclose cheque/PO for £ made payable to Swift Television Publications, or please debit my Access/Visa credit card,	
No	Postcode:

SALVAGED SPARES AND PCBs FOR:

HINARI CT18/TVA1

BUSH 2020/2020T/2114/2114T/2321/2321T

ALBA SAT 200/300

MARCONI BLUE CAP LNB ONLY

oadstar.

EXCLUSIVE SERVICE & SPARES

Mandale Mill, Beacon Road, Wibsey, Bradford, West Yorkshire BD6 3DQ

Telephone: 0274 690241 Fax: 0274 602701

User Friendly

SOFTWARE

FOR IBM COMPATIBLE PC'S RUNNING ON MSDOS FOR THE BUSY TV/VCR SHOP/SERVICE DEPT

RECEIPT/INVOICE PROGRAM £89 + VAT + P&P

OUR TV/VCR RENTAL PROGRAMME IS NOW AVAILABLE

Phone or write for details:

369 Chepstow Road TBR Software Newport, Gwent. NP9 8HJ Tel. 0633 282556

AMSTRAD PORTABLE PC'S FROM £149 (PPC1512SD). £179 (PPC1512DD). £179 (PPC1640SD). £209 (PPC1640DD). MODEMS £30 EXTRA.NO MANUALS OR

HIGH POWER CAR SPEAKERS. Stereo pair output 100w each 40hm impedance and consisting of 6.1/2" wooter 2" mid range and 1" tweeter. Ideal to work with the amplifier described above. Price per air 630 00 Order ret 30P7P

pair £30 00 Order ret survin.

2KV 500 WATT TRANSFORMERS Suitable for high voltage niments or as a spare for a microwave oven etc. 250v AC input. £10.00 ref 10P93E

MICROWAVE CONTROL PANEL Mains operated, with touch switches. Complete with 4 digit display, digital clock, and 2 relay outputs one for power and one for pulsed power (programmable). Ideal for all sorts of precision timer applications etc. £6.00 ref 6P18R FIBRE OPTIC CABLE. Stranded optical fibres sheathed in black

PVC. Five metre length £7.00 ref 7P29R

12V SOLAR CELL 200mA output ideal for trickle charging etc. 300 mm square. Our price £15.00 ref

15P42R

PASSIVE INFRA-RED MOTION SENSOR.

Complete with daylight sensor, adjustable lights on timer (8 secs -15 mins), 50' range with a 90 deg coverage. Manual ovende facility. Complete with wall brackets, bulb holders etc Brand O TO new and guaranteed. £25.00 ref 25P24R

Pack of two PAR38 bulbs for above unit £12.00

VIDEO SENDER UNIT Transmit both audio and video signals from either a video camera, video recorder or computer to any standard TV set within a 100' range! (tune TV to a spare channel). 12v DC op. £15.00 ref 15P39R Suitable mains adaptor £5.00 ref

11

FM TRANSMITTER housed in a standard working 13A adapter

(bug is mains driven). £26 00 ref 26P2R
MINATURE RADIO TRANSCEIVERS A pair of walkie talkies with a range of up to 2 kilometres. Units measure 22x52x155mm. Complete with cases. £30.00

FM CORDLESS MICROPHONE, Small hand held unit with a 500' rangel 2 transmit power levels reqs PP3 battery. Tuneable to any FM receiver. Our price £15 ref 15P42AR

12 BAND COMMUNICATIONS RECEIVER.9 short bands, FM, AM and LW DX/local switch, tuning 'eye' mains or battery. Complete with shoulder strap and mains lead NOW ONLY £19.00!! REF 19P14R.

WHISPER 2000 LISTENING AID. Enables you to hear sounds that would otherwise be inaudible! Complete with headphones Cased. £5.00 ref 5P179R.

CAR STEREO AND FM RADIOLow cost stereo system giving 5 watts per channel. Signal to noise ratio better than 45db, wow and flutter less than .35%. Neg earth. £25.00 ref 25P21R. LOW COST WALIKIE TALKIES Pair of battery oper-

ated units with a range of about 200'. Our price £8.00 a pair ref 8P50R
7 CHANNEL GRAPHIC EQUALIZERplus a 60 watt

ver amp! 20-21KHZ 4-8R 12-14v DC negative earth. Cased, £25

NICAD BATTERIES. Brand new top quality, 4 x AA's £4.00 ref 4P44R. 2 x C's £4.00 ref 4P73R, 4 x D's £9.00 ref 9P12R, 1 x PP3 £6.00 ref 6P35R

TOWERS INTERNATIONAL TRANSISTOR SELECTOR GUIDE. The ultimate equivalents book. Latest edition £20.00 ref

CABLE TIES, 142mm x 3.2mm white nylon pack of 100 £3.00 ref 3P104R. Bumper pack of 1,000 ties £14.00 ref 14P6R

1992 CATALOGUE AVAILABLE NOW IF YOU DO NOT HAVE A COPY PLEASE REQUEST ONE WHEN ORDERING OR SEND US A 6"X9" SAE FOR A FREE COPY.

GEIGER COUNTER KIT.Complete with tube, PCB and all com-GEIGER COUNTER KIT.Complete with tube, PCB and all components to build a battery operated geiger counter. £39.00 ref 39P1R
FM BUG KIT.New design with PCB embedded coil. Transmits to any FM radio. 9v battery req'd. £5.00 ref 5P158R
FM BUG Built and tested superior 9v operation £14.00 ref 14P3R
COMPOSITE VIDEO KITS. These convert composite video into separate H sync, V sync and video. 12v DC. £8.00 ref 8P39R.
SINCLAIR C5 MOTORS 12v 29A (full load) 3300 rpm 6*x4**1/4**
O/P shaft New £200 on £20P22R

O/P shaft. New. £20.00 ref 20P22R.
As above but with fitted 4 to 1 inline reduction box (800rpm) and

toothed nylon belt drive cog £40.00 ref 40P8R.
SINCLAIR C5 WHEELS13" or 16" dia including treaded tyre and

inner tube. Wheels are black, spoked one piece poly carbonate. 13" wheel £6.00 ref 6P20R, 16" wheel £6.00 ref 6P21R.

ELECTRONIC SPEED CONTROL KITfor c5 motor, PCB and all components to build a speed controller (0.95% of speed). Uses pulse width modulation. £17.00 ref 17P3R.

SOLAR POWERED NICAD CHARGER.Charges 4

AA nicads in 8 hours. Brand new and cased £6.00 ref

12 VOLT BRUSHLESS FAN4 1/2" square brand new ideal for boat, car, caravan etc. £5.00 ref 5P206.

ACORN DATA RECORDER ALF503 Made for BBC computer

ut suitable for others. Includes mains adapter, leads and book. 15.00 ref 15P43R

VIDEO TAPES. Three hour superior quality tapes made under licence from the famous JVC company. Pack of 10 tapes £20.00 ref

PHILIPS LASER, 2MW HELIUM NEON LASER TUBE. BRAND NEW FULL SPEC £40.00 REF 40P10R. MAINS POWER SUPPLY KIT £20.00 REF 20P33R READY BUILT AND TESTED LASER IN ONE CASE 275.00 REF 75P4R.
6V 10AH LEAD ACIDsealed battery by yuasha ex equipment but in excellent condition now only 2 for £10.00 ref 10P95R.
12 TO 220V INVERTER KITAS supplied it will handle up to about

15 w at 220 v but with a larger transformer it will handle 80 watts, Basic kit £12.00 ref 12P17R. Larger transformer £12.00 ref 12P41R.

VERO EASI WIRE PROTOTYPING SYSTEMIdeal for designing projects on etc. Complete with tools, wire and reusable board. Our price £6,00 ref 6P33R.

MICROWAVE TURNTABLE MOTORS. Ideal for window displays etc. £5.00 ref 5P165R. STC SWITCHED MODE POWER SUPPLY220v or 110v input

giving 5v at 2A, +24v at 0.25A, +12v at 0.15A and +90v at 0 4A £6.00

HIGH RESOLUTION 12" AMBER MONITORI 2v 1.5A Hercules compatible (TTL input) new and cased £22,00 ref 22P2R VGA PAPER WHITE MONO monitors new and cased 240v AC. £59.00 ref 59P4R

25 WATT STEREO AMPLIFIERs, STK043. With the addition of a handful of components you can build a 25 watt amplifier. £4.00 ref

LINEAR POWER SUPPLY Brand new 220v input +5 at 3A, +12 12 at 1A. Short circuit protected, £12.00 ref 12P21R

MINI RADIO MODULE Only 2" square with ferrite aerial and tuner. Superhet Reg's PP3 battery, £1.00 ref BD716R.
BARGAIN NICADS AAA SIZE 200MAH 1.2V PACK OF 10

£4.00 REF 4P92R, PACK OF 100 £30.00 REF 30P16R FRESNEL MAGNIFYING LENS 83 x 52mm £1.00 ref BD827R. ALARM TRANSMITTERS. No data available but nicely made

complex transmitters 9v operation, £4:00 each ref 4P81R. UNIVERSAL BATTERY CHARGER, Takes AA's, C's, D's and PP3 nicads. Holds up to 5 batteries at once. New and cased, mains operated. £6 00 ref 6P36R.

COLOUR MONITORS

AMSTRAD CTM644

RGB INPUT £75.00 REF A75P1

RESISTOR PACK. 10 x 50 values (500 resistors) all 1/4 watt 2%

metal film. £5.00 ref 5P170R.

CAPACITOR PACK 1.100 assorted non electrolytic capacitors

£2.00 ref 2P286R.

CAPACITOR PACK 2. 40 assorted electrolytic capacitors £2.00 ref 2P287R

QUICK CUPPA? 12v immersion heater with lead and cigar lighter lua £3 00 ref 3P92R

LED PACK .50 red leds, 50 green leds and 50 yellow leds all 5mm

FERRARI TESTAROSSA A true 2 channel radio controlled car forward, reverse, 2 gears plus turbo. Working headlights. £22.00 ref 22P6R.

MIRACOM WS4000 MODEMS

V21/23

AT COMAND SET

AUTODIAL/AUTOANSWER

FULL SOFTWARE CONTROL TONE AND PULSE DIALLING

£29

PIR LIGHT SWITCH Replaces a standard light switch in seconds light operates when anybody comes within detection range (4m) and stays on for an adjustable time (15 secs to 15 mins). Complete with daylight sensor. Unit also functions as a dimmer switch! 200 watt max, Not suitable for flourescents. £14.00 ref 14P10R CUSTOMER RETURNED 2 channel full function radio controlled

ars only £8 00 ref 8P200R

WINDUP SOLAR POWERED RADIO! FM/AM radio takes rechargeable batteries complete with hand charger and solar panel

240 WATT RMS AMP KIT Stereo 30-0-30 psu required £40,00 ref

300 WATT RMS MONO AMP KIT £55.00 Psu required ref

ALARM PIR SENSORS Standard 12v alarm type sensor will interface to most alarm panels, £16,00 ref 16P200 ALARM PANELS 2 zone cased keypad entry, entry

etc. £18.00 ref 18P200 MODEMS FOR THREE POUNDS!!

Fully cased UK modems designed for dial up system (PSTN) no data or info but only £3.00 ref 3P145R TELEPHONE HANDSETS

Bargain pack of 10 brand new handsets with mic and speaker only £3.00 ref 3P146R BARGAIN STRIPPERS

Computer keyboards. Loads of switches and components excellent at £1.00 ref CD40R PC POWER SUPPLIES

These units are new but need attention complete with case, fan IEC

BULL ELECTRIC

250 PORTLAND ROAD HOVE SUSSEX BN3 5QT TELEPHONE 0273 203500 MAIL ORDER TERMS: CASH PO OR CHEQUE WITH ORDER PLUS £3.00 POST PLUS VAT.

PLEASE ALLOW 7 - 10 DAYS FOR DELIVERY



NEXT DAY DELIVERY \$8,00 FAX 0273 23077



input plug disc drive and mother board fly leads. Our price is £5.00 (less than the fan alone would cost!) ref 5P208R

HIGH VOLTAGE CAPACITORS

A pack of 20 500PF 10KV capacitors ideal for ionizers TV repairs and high voltage experiments etc. Price is £2.00 ref 2P378R DATA RECORDERS

Customer returned mains bettery units built in mic ideal for Computer or general purpose audio use. Price is £4.00 ref 4P100R SPECTRUM JOYSTICK INTERFACE

Plugs into 48K Spectrum to provide a standard Atari type joystick port. Our price £4.00 ref 4P101R ATARI JOYSTICKS

e interface, our price £4.00 ref 4P102R BENCH POWER SUPPLIES

Superbly made fully cased (metal) giving 12v at 2A plus a 6V supply. Fused and short circuit protected. For sale at less than the cost of the case! Our price is £4.00 ref 4P103R SPEAKER WIRE

Brown twin core insulated cable 100 feet for £2.00 REF 2P79R MAINS FANS

Brand new 5" x 3" complete with mounting plate quite powerfull and quite. Our price £1 00 ref CD41R DISC DRIVES

Customer returned units mixed capacities (up to 1.44M) We have not sorted these so you just get the next one on the shelf. Price is only £7.00 ref 7P1R (worth it even as a stripper)

HEX KEYBOARDS Brand new units approx 5" x 3" only £1.00 each ref CD42R

51/2" x 31/2" x 1" black ABS with screw on lid. £1.00 ref CD43R SCART TO SCART LEADS

Bargain price leads at 2 for £3.00 ref 3P147R

SCART TO D TYPE LEADS

Standard Scart on one end, Hi density D type on the other. Pack of ten leads only £7.00 ref 7P2R

OZONE FRIENDLY LATEX 250ml bottle of liquid rubber sets in 2 hours, Ideal for mounting PCB's

etc. £2.00 each ref 2P379R QUICK SHOTS

Standard Atan compatible hand controller (same as joysticks) our price is 2 for £2.00 ref 2P380R

VIEWDATA SYSTEMS Brand new units made by TANDATA complete with 1200/75 built in modern infra red remote controlled qwerty keyboard BT appproved Prestel compatible, Centronics printer port RGB colour and composite output (works with ordinary television) complete with power supply and fully cased. Our price is only £20:00 ref 20P1R 3 INCH DISCS

Ideal for Amstrad PCW and Spectrum +3 machines pack of 10 discs is £12.00 ref 12P1R

AC STEPDOWN CONVERTOR

Cased units that convert 240v to 110v 3" x 2" with mains input lead and 2 pin American output socket (suitable for resistive loads only) our price \$2,00 ref 2P381R

SPECTRUM +3 LIGHT GUN PACK complete with software and instructions £8.00 ref 8P58R **CURLY CABLE**

Extends from 8" to 6 feet! D connector on one end, spade connectors on the other ideal for joysticks etc (6 core) £1.00 each ref CD44R COMPUTER JOYSTICK BARGAIN

Pack of 2 joysticks only £2 00 ref 2P382R MINI MONO AMPLIFIER PACK

4 amplifiers for £2.00! 3 watt units 9-12v operation ideal for experiments etc £2.00 ref £2383R

BUGGING TAPE RECORDER

Small hand held cassette recorders that only operate when there is sound then turn off 6 seconds after so you could leave it in a room all day and just record any thing that was said. Price is £20.00 ref 20P3R IFC MAINS LEADS

Complete with 13A plug our price is only £3.00 for TWO! ref 3P148R COMPUTER SOFTWARE BARGAIN

10 cassettes with games for commodore 64, Spectrum etc. Our bargain price one pound! ref CD44R **NEW SOLAR ENERGY KIT**

Contains 8 solar cells, motor, tools, fan etc plus educational booklet Ideal for the budding enthusiast! Price is £12.00 ref 12P2R FUSE PACK NO 1

Fifty fuses 1 1/4" long (glass) quick blow 10 popular values £2.00 ref FUSE PACK NO 2 ifty fuses 20mm long (glass) quick blow 10 popular values £2.00 ref

2P385R

POTENTIOMETER PACK NO 1 30 pots for £3.00! ideal for projects etc. Ref CD45R

286 MOTHER BOARD WITH 640K RAM FULL SIZE METAL CASE, TECHNICAL MANUAL, KEYBOARD AND POWER SUP-PLY £139 REF 139P1 (no i/o cards or drives included)

35MM CAMERAS Customer returned units with built in flash and

28mm lens 2 for £8.00 ref 8P200 STEAM ENGINE Standard Mamod 1332 60 engine complete with boiler piston etc £30 ref 30P200

TALKING CLOCK

LCD display, alarm, battery operated Clock will announce the time at the push of a button and when the alarm is due. The alarm is switchable

from voice to a cock crowing!£14.00 ref 14P200.R

HANDHELD TONE DIALLERS

Small units that are designed to hold over the mouth piece of a telephone to send MF dialling tones. Ideal for the remote control of answer machines. £5.00 ref 5P209R

COMMODORE 64 MICRODRIVE SYSTEM

Complete cased brand new drives with disc and software 10 times faster than tape machines works with any Commodore 64 setup. The orginal price for these was £49.00 but we can offer them to you at only £25.00! Ref 25P1R USED SCART PLUGS

Packof 10 plugs suitable for making up leads only £5.00 ref 5P209R C CELL SOLAR CHARGER

Same style as our 4 x AA charger but holds 2 C cells. Fully cased with flip top lid. Our price £6.00 Ref 6P79R

SOME OF OUR PRODUCTS MAY BE UNLICENSABLE IN THE UK

								-				
	BA3704 £2.75		LMLM6417£1.80	MM5458N £2.50 MM55108£2.65		5.80 TA7241AP .	£3.00	TDA1035	£1.90	TDA2600 £6.80	UA78/10 £2.00	2SC2632 £
	BA4210 £2.50 BA4220 £2.00		LM748CN 8 PIN £1.25	MM7317 £3.75	STK4392£	0.00 TA7243 7.00 TA7245	£3.30 £4.50	TDA1035T TDA1037	£1.90 £2.90	TDA2611A£1.00 TDA26400£3.50	UA78M15 £2.00 UAA1008DP £2.00	2SC2958£
AN2140 £2.50	BA4220 £2.00 BA4236 £2.75		LM748N£2.00	MM74C901 £1.10	STK441£1	D.50 TA7267P	£2.80	TDA1044	£2.50	TDA2653A £2.75.	UC38445£5.00	2SC2979 £ 2SC3153 £
AN240P	BA4402 £1.90	L7824£0.95	M104£7.00 M29381£11.00	MPD4011C£2.00 MPD4069C£1.10	STK459£1	1.00 TA7270P 0.50 TA7271P	£2.50 £3.25	TDA1044U	£1.50	TDA2822 £2.00 TDA3190 £0.95	UPC1185H2 £2.50 UPC1185H2 £5.00	2SC3402 £
	BA4403 £2.75		M490BB1 £12.50	MPD4081 £1.10	STK463£1	4.50 TA7274	£2.60	TDA1057	£2.00	TDA3303 £15.00	UPC1225H£2.75	2SC3519£
AN3822 £7.50	BA5102 £2.45 BA5204 £2.75		M491B/BB1 £11.50	MPD45148C £5.00	STK465£1	2.00 TA7280	£3.00	TDA1082	£3.50	TDA3330 £5.50	UPC1230 £3.00	2SC3678£ 2SC3715£
	BA5204 £2.75 BA524 £3.00		M50127AP £6.00 M50431-101SP	MPD5521066 £11.00 MSL9378RS£3.50		6.50 TA7280P 6.50 TA7281	£3.00 £2.75	TDA1151	£1.50	TDA3540£4.00 TDA3541£2.25	UPC1238V	2SC458£
	BA5402 £2.40	L7924£0.80	\$6.50	MSM5840H-84RS	STK5325£	5.50 TA7281P	£2.75	TDA1154	£2.70	TDA3560 £3.40	UPC1288V£2.95	2SC789 £
	BA5406 £2.50		M50453-012P £6.20 M50560-01P£2.70	\$14.50 \$AA1006\$2.50		6.00 TA7299P 3.50 TA7302	£3.00	TDA1170S	£1.20	TDA3561 £2.50 TDA3562A £5.00	UPC1361C£3.90 UPC1362C£4.50	2SD1047
	BA6104 £2.50 BA6109 £1.80	LA1185 £2.60 LA1201 £0.95	M51014L £1.95	SAA1025£5.80	STK5333£1	2.00 TA7303	£1.10	TDA1180P	£3.00	TDA3565 £3.00	UPC1363 £1.90	2SD1128£
AN5521 £5.50	BA6124 £2.75	LA1235 £2.50	M51164 £1.40	SAA1124 £3.95		6.00 TA7310	£1.75	TDA1190	£1.90	TDA3571BQ £5.50	UPC1365 £3.50	2SD1138
	BA6154 £2.54 BA6208 £2.75		M51356P£5.00 M51381P£1.50	SAA1174 £6.50 SAA1250 £2.60		6.25 TA7312 6.50 TA7313	£1.75	TDA1270M TDA1365	£4.10 £4.90	TDA3590 £3.00 TDA3651 £3.00	UPC1377C£2.20 UPC1378H£2.00	2SD1207 £
AN5760 £2.00	BA6209 £3.21	LA3160£1.90	M51393 £4.25	SAA1251 £8.50	STK5422£	5.00 TA7313AP .	£1.40	TDA1412	£1.00	TDA3651AQ£6.50	UPC1379 £2.20	2SD1273£
AN5900 £1.50	BA6219 £1.95	LA3210 £1.90	M51513 £10.00	SAA1276 £4.50 SAA1290-02 £10.70		6.5D TA7314	£2.00 £3.25	TDA1470	£5.00	TDA3652 £7.50 TDA3653 £4.00	UPC 1382 £1.50	2SD1275£ 2SD1288£
	BA6222 £3.11 BA6229 £1.8	LA3220£1.00	M51515L £3.10 M51516 £4.00	SAA1293-02 £14.00		5.30 TA7323 5.25 TA7325	£3.25	TDA1501A TDA1506	£3.20 £8.50	TDA3653 £4.00 TDA3654 £2.80	UPC1394 £1.70 UPC1420A £7.00	2SD138£1
AN6341 £2.75	BA6238A £1.95	LA3361 £1.50	M51903L £3.50	SAA3027 £6.00	STK5476£	6.00 TA7325P	£1.50	TDA1510	£3.20	TDA3810 £2.90	UPC1458 £1.95	2SD1391 £
	BA6239 £3.75 BA6259 £3.00	LA3600 £3.50	M5213L £3.10 M52184 £1.00	SAA5000 £3.00 SAA5010 £5.80		5.00 TA7328 5.20 TA7335	£1.50	TDA1510A TDA1512	£3.20	TDA3950£3.00 TDA440£2.00	. UPC1513HA £2.00 UPC1520CA £2.48	2SD1398 £
AN6346 £4.50 AN6346 £4.50	BA6259 £3.04 BA6301 £2.00	LA3700£2.50	M52314 £1.10	SAA5012£6.60		7.00 TA7335P	£4.20	TDA1515A	£2.50	TDA4420 £2.45	UPC339C£0,70	2SD1426£
AN6359£5.50	BA6302A £1.80	LA4102 £1.20	M54519P£1.00	SAA5020£5.80		5.25 TA7342	£2.10	TDA1520	£3.95	TDA4422 £3.95	UPD4011 £1.75	2SD1453£ 2SD1455/2SD173
AN6360 £3.75 AN6362 £4.25	BA6304 £1.70 BA6305 £1.71	LA4125 £2.00 LA4140 £0.70	M54543 £1.75 M54544L £1.85	SAA5030 £9.00 SAA5040A £5.00	STK6962	3.20 TA7343 6.00 TA7350	£1.75	TDA1670A	£3.00	TDA4500 £3.80 TDA4501 £4.00	UPD4066 £1.95	23
AN6387£5.50	BA681 £0.90	LA4160 £1.25	M54548L £4.50	SAA5040B £9.90	STK7216£	6.10 TA7358	£1.50	TDA1770A	£3.00	TDA4503 £4.50	TRANSISTORS	2SD1496£6
AN6612£2.20	BA7001 £1.9	LA4182 £2.10	M58478P£4.75	SAA5041 £9.50 SAA5050 £14.00	STK7308	5.75 TA7607 7.00 TA7607AP .	£3.50	TDA1870A TDA1905	£2.60	TDA4505 £6.75 . TDA4510 £4.40	2N3773 £1.90	2SD1497
AN6651	BA718£1.80 BA728£1.10		M58655P £6.50 M58839 £8.00	SAA5231£9.00		5.00 TA7609P	£2.70	TDA1908A	£1.75	TDA4600£2.60	2SA1095 £5.50 2SA1102 £1.90	2SD1497-06 £
AN6677 £5.25	BA7767S £5.01	I A4422 £1.30	M708£5.50	SAB3013£4.50	STK7356£	6.50 TA7614	£2.50	TDA1940	£1.80	TDA4600-2£2.60	2SA1112£0.95	2SD1650 E 2SD1877 E
	BTT6018 £3.5i		M709 £4.75 MA150-E £2.20	SAB3037 £11.00 SAF1032P£6.00	STK7358	6.50 TA7628P 4.75 TA7629	£2.40 £4.00	TDA1950 TDA2002	£2.50 £1.40	TDA4601 £2.10 TDA4610 £4.50	2SA1124 £0.35 2SA1220 £1.10	2SD639
AN6912 £2.00 AN7111 £1.50	HA11215A £3.54 HA11223 £3.75		MA150-E £2.20 MB3106 £1.00	SAF1039P £2.00	STR1096£	3.60 TA7629P		TDA2003	£1.30	TDA5101£2.00	2SA1386£4.70	2SD667£
AN7112 £3.00	HA11225 £2.11	LA4461 £1.80	MB3730 £2.75	SASS60		5.50 TA7630P	£2.00	TDA2004	£1.70	TDA7250 £5.50 TDA7607AP £2.40	2SA564 £0.40	2SD725 £2 2SD787E £2
AN7116 £1.20 AN7143 £1.65	HA11226 £3.78 HA11235 £3.10	LA4500 £2.70 LA4570 £2.20	MB3731 £3.25 MC13002P £5.00	SAS570		8.00 TA7640 5.95 TA7658	£2.00	TDA2005 TDA2005S	£1.70 £2.95	TDA7607AP £2.40 TDA8180 £6.00	2SA673 £0.20 2SA942 £0.35	2SD811
AN7148£1.70	HA1124A £1.7	LA5522£2.20	MC1310 £1,25	SAS590 £3.50	STR440£	5.00 TA7668	£2.00	TDA2006V	£1.95	TDA8190 £3.80	2SA985£0.95	2SD836£1 2SD837£1
AN7158 £4.00	HA11414 £2.50		MC1330P£2.95 MC14001BCP £1.10	SL1430 £2.80 SL1431 £2.80		5.00 TA7680 4.95 TA7681AP .	£4.80 £5.75	TDA2020	£3.50 £1.10	TDA8341 £3.00 TDA9503£2.55	2SB1016. £1.50 2SB772 £0.40	2SD845
AN7160 £6.00 AN7169 £3.50	HA11713		MC14093B £1.50	SL1432 £1.10		4.85 TA7687	£2.00	TDA2030H	£2.00	TDA9513 £2.95	2SB772 £0.40 2SB775 £1.60	2SD868£
AN7171K £8.00	HA11714 £3.5	LA7096 £4.00	MC14426P £2.20	SL471DP £2.20		7.90 TA7698A	26.85	TDA2030V	£1.75	TEA1009 £2.00	2\$B819£0.55	2SD869 CS
AN7205 £1.95 AN7213 £1.10	HA11715£3.21		MC14429P \$2.20 MC14497P \$5.50	SL480		5.50 TA7698AP . 5.95 TA7705P	£7.50	TDA2040 TDA2151	£2.00	TEA1014 £2.00 TEA1039 £2.00	2SB965 £2.30 2SC1413A £2.50	2SD871£4
AN7218 £1.20	HA11749 £7.0	LA7309 £3.75	MC14511BCP £2.00	SL901B £3.00	STR58041 £	6.75 TA7709	£2.50	TDA2161	£1.75	TEA2018 £2.10	2SC1826£1.80	2SD895 C
AN7220 £1.60	HA11750 £3.5i HA12005 £3.8i	LA7507 £4.00	MC145168CP £2.00	SL917B £2.50 SN76670N £1.25		4.90 TA7738 4.15 TA78L010P	£2.50	TDA2170 TDA2270	£3.00 £2.20	TEA2018A £2.10	2SC1942£2.10	2SD898B C
AN7222 £2.10 AN7223 £7.60	HA12005 £3.8	D LA7520 £3.25 D LA7800 £1.50	MC1458/UPC1458 £1.95	SSA1075£5.90		2.00 TA8101N	£4.25	TDA2320	£0.90	TL011CP £2,00	2SC1983£1.30 2SC2003£0.25	2\$D9008 £4
AN7224 £1.40	HA12026 £2.04	LA7801 £1.25	MC3359 £1.10	SSA1250£3.50	TA4180 £	3.00 TA8102P	£4.25	TDA2510	£4.30	TL072CP £2.00	2SC2027 £4.50	BC107B
AN7225£1.90 AN7273£2.00	HA2413 £1.20 HA13001 £1.80		MCU2632 £1.90 MDA2061 £7.00	ST082 £12.00 ST1195 £5.50		5.00 TA8644 5.50 TAA310A	£5.50 £2.00	TDA2521/3 TDA2522Q	£9.75	TMM 2114AP . £5.75 TMS1944AN2L £2.00	2SC2230	BC108B £0
AN7310£1.10	HA13402 £8.2		MDA2062 £3.50	STA401A£3.75	TA4301 £	4.50 TAA550	£2.10	TDA2530Q	£4.25	TMS1952£2.50	2SC2331£1.00	BC115 £0
AN7311£1.75	HA13403 £4.0	D LM1011N£3.00	MEA2050£4.60	STA441C £3.00		3.40 TBA120S	£0.50	TDA2532 TDA2532Q	£3.00	TMS1956 £2.30 TMS1965NL£2.00	2SC2335£1.50	BC147A E
AN7315 £1.75 AN7324 £4.50	HA1350 £9.0 HA1368R £2.5		MEA2901 £3.00 MH27316 £3.00	STK0029 £4.30 STK043 £10.00	TA4350 £	6.00 TBA530 1.25 TBA560	00.13	TDA2540	£3.00	TMS3450£2.10	2SC2531	BC159 £0
AN7410£2.10	HA1374 £6.0	D LM1035 £5.75	ML232B £4.50	STK082 £12.00	TA7137 £	1.25 TBA750Q	£4.20	TDA2541	£2.00	TMS3615£1.75	2SC2570£0.55	BC171 £0
AN7415 £1.40	HA1377£2.0		ML237 (BTT6018)	STK2029 £8.50 STK2125 £12.00	TA7176 £	2.50 TBA800 2.40 TBA820M	£0.85	TDA2543 TDA2560	£5.25 £3.75	U410B £1.60	2SC2577£1.50	BC172C£0
AN7420 £3.20 AN7818F £1.60	HA1388 £4.0 HA1392 £3.0	D LM1112CN £3.30 D LM13600 £5.00	ML238B £7.50	STK2250£12.00		2.40 TBA820M 4.00 TBA920S	21.00	TDA2560Q	£1.10	UA767PC £1.20	2SC2592 £0.95 2SC2621 £1.25	BC182L £0
B1403£1.00	HA1394£4.0	D LM1868N £1.50	M293 £4.00	STK3041£5.70	TA7193P£	6.00 TCA640	£3.75 £3.95	TDA2576A		UA78/10£2.00	2SC2631£0.30	BC183 £0
BA1320 £1.50 BA1332 £1.00	HA1397 £5.4 HA1398 £3.5	D LM1894N£5.75 D LM317T£1.00	ML923 £4.50 ML923DP £4.50	STK40090 £8.00 STK4121 II £8.75		1.75 TCA650 1.25 TCA660B	£3.95 £3.50	TDA25771 TDA2578	£2.80 £3.00	ACCUSED ON THE		
BA301B£1.50	HA1406 £2.0	D LM324 £0.80	ML926 £4.20	STK4141 II £6.90	TA7222 £	2.25 TDA1005	£2.50	TDA2578A	£2.80	No. of Lot, Lot, Lot, Lot, Lot, Lot, Lot, Lot,	FLEG	FDICE
BA318 £2.50	HA1457 £2.1		MM314APL £1.75	STK4142 II £10.00 STK4151 £11.50		2.50 TDA1010A .	£1.10	TDA2579 TDA25810	£3.50 £2.50	A. Z.	ELECT	IKIUS
BA328 £1.10 BA3308 £2.10	HA4219£2.7 HD14081£0.2	0 LM339N £0.75 5 LM384 £1.20	MM53108N £1.25 MM5387 £2.90	STK4171 II£9.00	TA7227P	2.30 TDA1011	£1.20	TDA2582	£2.55	The second second		
BA333 £1.40	HD4539 £0.7	D LM386N £0.80	MM5402 £1.50	STK430 £6.00	TA7232P	1.50 TDA1013A .	£1.90	TDA2590	£2.00	SEE A	DDRESS D	ETAILS
	KA2210£2.3	D LM556CN8 £2.50	MM5405N £3.50	STK4311£10.20	TA7233P	2.10 TDA1015	£1.20	TDA2591	£2.70	Drugger of the Control of the		
BA3416L£2.75 BA343 £1.20	L7805£0.8	D LM6402G-2003	MNI5456 £2.25	STK433 £7.50	TA7240 £	2.50 TDA1020	£2.50	TDA2593	£1.50	-04	NEXT PA	CE

PHONE TODAY

RENTAL FINANCE TVs, VCRs, Satellite

STOCKING FINANCE TVs, VCRs, Satellite

BLOCK DISCOUNTING Rental & HP Agreements

820968

Written Quotations Available On Request



Broughfame Limited Colonnade House High Street WORTHING West Sussex BN11 1NZ

REBUILT

First Independent Rebuilder with B.S.I. Certification

PIL - In Line - FST N.G.T. ELECTRONICS LTD.

120, Selhurst Road, London SE25 6LL

PHONE: 081-771 3535 Britain's Oldest Established TV Tube Rebuilder

HOW THEY WORK! HOW TO TEST! HOW TO REPLACE!

Designed specifically for Domestic Appliance Engineers who want to enter the fast

growing microwave Industry. Packed full of useful

information, presented in a simple yet informative style

with comprehensive diagrams and illustrations.

Fault finding procedures are included at the end

of each section.

The book contains easy to

follow electronic control systems.



We also supply microv

OVEN SERVICING

SWIFTPARK LIMITED

113 LONDON ROAD, HORNDEAN, WATERLOOVILLE, HANTS, PO8 0BJ

Stock items despatched by return

Access & Visa Accepted

TRANSISTORS B0244		TDA8180 ORIO	SINAL	£9.50
BC212			BD244£0.30	
BC213		BC184£0.09	BD244C £0.30	
BC2114A C0.07 BD508 BU.90 BU.90 BU.500 C1.00 BC214B C0.07 BF195 C0.07 BJ508A C1.00 BC214L C0.09 BF195 C0.07 BJ508A C1.70 BC23F C0.07 BF197 C0.15 BJ508AF C1.70 BC23F C0.07 BF197 C0.15 BJ508AF C1.70 BC23F C0.07 BF197 C0.15 BJ508AF C1.70 BC23B C0.07 BF197 C0.15 BJ508AF C1.70 BC23B C0.07 BF199 C0.14 BJ506 C1.75 BC30F C0.12 BF199 C0.14 BJ60F C0.75 BC30F C0.12 BJ708AF C0.15 BJ708AF C1.05 BF199 C0.15 BJ708AF C1.65 BC33F C0.17 BF199 C0.15 BJ708AF C1.65 BC33F C1.00 BF472 C0.25 BJ708AF C1.65 BC34F C1.00 BF472 C0.25 BJ708AF C1.65 BC34F C1.00 BF472 C0.25 BF191 C0.		BC213£0.09	BD434 £0.80	BU426A £1.00
BC214L . 20.09 BF196 . 20.15 BU508A F. 17.00 BC238 . 20.07 BF197 . 20.15 BU508A F. 17.00 BC238 . 20.07 BF198 . 20.07 BU506 . 20.75 BU506 . 20.		BC214A £0.07	8D508 £0.90	BU500 £1.00
BC238 10.07 BF198 10.07 BC308 10.12 BF199 10.14 BC308B 10.07 BF244 10.40 BUT11 10.95 BC307 25 10.07 BF259 10.02 BUT114 11.95 BC327 25 10.07 BF259 10.02 BUT114 11.95 BC328-40 .00.55 BF472 10.15 BUW84 11.65 BC337 10.07 BF458 10.22 BUT114 11.05 BC337 10.07 BF458 10.22 BUW84 11.65 BC337 10.07 BF458 10.22 SU12659 10.72 BC441 10.25 BF479 10.25 TIP110 10.45 BC461 10.25 BF479 10.25 TIP110 10.45 BC548 10.07 BF3708F472 10.5 TIP11 10.04 BC548 10.07 BF3708F472 10.5 TIP11 10.04 BC549 10.07 BF3708F472 10.7 TIP11 10.07 BC599 10.07 BS 10.08 10.75 TIP11 10.00 BC557 10.00 BU126 10.70 TIP11 10.00 BC557 10.00 BU126 10.70 TIP11 10.00 BC557 10.00 BU126 10.70 TIP11 10.00 BC559 10.00 BU126 10.70 TIP11 10.00 BC			BF195 £0.07	BU508A £1.00
BC238 10.07 BF198 10.07 BC308 10.12 BF199 10.14 BC308B 10.07 BF244 10.40 BUT11 10.95 BC307 25 10.07 BF259 10.02 BUT114 11.95 BC327 25 10.07 BF259 10.02 BUT114 11.95 BC328-40 .00.55 BF472 10.15 BUW84 11.65 BC337 10.07 BF458 10.22 BUT114 11.05 BC337 10.07 BF458 10.22 BUW84 11.65 BC337 10.07 BF458 10.22 SU12659 10.72 BC441 10.25 BF479 10.25 TIP110 10.45 BC461 10.25 BF479 10.25 TIP110 10.45 BC548 10.07 BF3708F472 10.5 TIP11 10.04 BC548 10.07 BF3708F472 10.5 TIP11 10.04 BC549 10.07 BF3708F472 10.7 TIP11 10.07 BC599 10.07 BS 10.08 10.75 TIP11 10.00 BC557 10.00 BU126 10.70 TIP11 10.00 BC557 10.00 BU126 10.70 TIP11 10.00 BC557 10.00 BU126 10.70 TIP11 10.00 BC559 10.00 BU126 10.70 TIP11 10.00 BC		BC237£0.07	BF197 £0.15	BU508D£1.00
BG2382-40. 20.05 BF422 D.15 BUW84 C.16.65 BG237 C.50.07 BF458 D.0.22 BUX84 D.60 BG377 C.50.07 BF458 D.0.22 SD12659 D.75 BG392 C.15.00 BF4589 F471 D.0.25 TIP110 D.0.45 BC461 D.25 BF471 D.0.25 TIP110 D.0.45 BC461 D.25 BF472 D.25 TIP110 D.0.45 BC461 D.25 BF472 D.25 TIP110 D.0.45 BC547 D.0.7 BF472 D.0.25 TIP110 D.0.45 BC547 D.0.7 BF472 D.0.25 TIP110 D.0.45 BC548 D.0.7 BF472 D.0.25 TIP21 D.0.30 BC548 D.0.7 BF472 D.0.25 TIP31 D.0.30 BC548 D.0.7 BF472 D.0.25 TIP31 D.0.30 BC559 D.0.7 BU126 D.70 TIP41 D.0.27 BC59 D.0.30 BUX08 D.0.75 TIP31 D.0.30 BC559 D.0.30 BUZ08 D.0.70 TIP41 D.0.27 BC639 D.0.30 BUZ08 D.0.70 TIP41 D.0.27 BC639 D.0.30 BUZ08 D.0.70 TIP41 D.0.27 BC639 D.0.30 BUZ08 D.0.30 BUZ08 D.0.30 TIP47 D.0.98 BD137 D.0.50 BUZ08 D.1.00 TIP47 D.0.98 BD137 D.0.50 BUZ08 D.1.00 TIP47 D.0.98 BD137 D.0.55 BUZ08 D.0.70 BUZ08 D.0.30 TIP47 D.0.98 BD137 D.0.55 BUZ08 D.0.30 BUZ08 D.		BC23B£0.07	BF198 £0.07	RUBOS TTI 75
BG2382-40. 20.05 BF422 D.15 BUW84 C.16.65 BG237 C.50.07 BF458 D.0.22 BUX84 D.60 BG377 C.50.07 BF458 D.0.22 SD12659 D.75 BG392 C.15.00 BF4589 F471 D.0.25 TIP110 D.0.45 BC461 D.25 BF471 D.0.25 TIP110 D.0.45 BC461 D.25 BF472 D.25 TIP110 D.0.45 BC461 D.25 BF472 D.25 TIP110 D.0.45 BC547 D.0.7 BF472 D.0.25 TIP110 D.0.45 BC547 D.0.7 BF472 D.0.25 TIP110 D.0.45 BC548 D.0.7 BF472 D.0.25 TIP21 D.0.30 BC548 D.0.7 BF472 D.0.25 TIP31 D.0.30 BC548 D.0.7 BF472 D.0.25 TIP31 D.0.30 BC559 D.0.7 BU126 D.70 TIP41 D.0.27 BC59 D.0.30 BUX08 D.0.75 TIP31 D.0.30 BC559 D.0.30 BUZ08 D.0.70 TIP41 D.0.27 BC639 D.0.30 BUZ08 D.0.70 TIP41 D.0.27 BC639 D.0.30 BUZ08 D.0.70 TIP41 D.0.27 BC639 D.0.30 BUZ08 D.0.30 BUZ08 D.0.30 TIP47 D.0.98 BD137 D.0.50 BUZ08 D.1.00 TIP47 D.0.98 BD137 D.0.50 BUZ08 D.1.00 TIP47 D.0.98 BD137 D.0.55 BUZ08 D.0.70 BUZ08 D.0.30 TIP47 D.0.98 BD137 D.0.55 BUZ08 D.0.30 BUZ08 D.	ı	BC308B 50.07		BU807 £0.75 BUT11 £0.95
BG2382-40 . 50 . 50 BF422 . 50 . 15 BUV84 . C1 . 65 BG237 . 50 . 07 BF458 . 50 . 22 BUV84 . C1 . 65 BG237 . 50 . 07 BF458 . 50 . 22 BUV84 . C1 . 65 BG392 . C1 . 50 BF459 . 50 . 22 SD12659 . 50 . 75 BF459 . 50 . 25 TIP110 . 50 . 45 BG392 . C1 . 50 BF459 . 50 . 25 TIP110 . 50 . 45 BG461 . 50 . 25 BF471 . 50 . 25 TIP110 . 50 . 45 BG461 . 50 . 25 BF472 . 50 . 25 TIP110 . 50 . 45 BG547 . 50 . 07 BF472 . 50 . 25 TIP12 . 50 . 45 BG547 . 50 . 07 BF472 . 50 . 25 TIP13 . 50 . 46 BG548 . 50 . 07 BF472 . 50 . 25 TIP31 . 50 . 30 BG548 . 50 . 07 BF472 . 50 . 25 TIP31 . 50 . 30 BG549 . 50 . 07 BV126 . 50 . 70 TIP41 . 50 . 37 BG557 . 50 . 30 BV1268 . 50 . 70 TIP41 . 50 . 30 BG559 . 50 . 16 BV268 . 51 . 60 TIP47 . 50 . 30 BG559 . 50 . 16 BV268 . 51 . 60 TIP47 . 50 . 30 BG559 . 50 . 60 BV268 . 51 . 60 TIP47 . 50 . 30 BG559 . 50 . 50 BV268 . 51 . 60 TIP47 . 50 . 30 BG559 . 50 . 50 BV268 . 51 . 60 TIP47 . 50 . 30 BG559 . 50 . 50 BV268 . 50 . 60 BV268 . 50 . 50 BF156	١	BC327-25£0.07	BF259 £0.22	BUT11AF £1.95
BC392		BC328-40£0.05	BF422 £0.15	BUW84 £1.65
BC392		BC372 £0.07	BF459 £0.22	SD12659 20.75
BC461		BC392£1.50	BF469/BF471	T9064V £2.28
BC547	1	BC441 £0.25	EU.25 RE471 £0.25	TIP110 £0.45
B0549		BC547£0.07	BF472 £0.25	TIP29 £0.30
BC559B £0.07 BU126 D.70 TIPA1 £0.27 BC539B £0.18 BU20B £1.00 TIPA2 £0.40 BC640 £0.30 BU20B £1.00 TIPA2 £0.40 BC640 £0.30 BU20B £1.00 TIPA2 £0.98 BD131 £0.50 BU20B £1.00 TIPA3 £0.98 BD131 £0.50 BU20B £1.00 TIPA3 £0.98 BD132 £0.35 BU20B £1.00 TIPA3 £0.55 BD137 £0.35 BU20B £1.00 TIPA3 £0.55 BD137 £0.35 BU20B £1.00 TIPA3 £0.55 BD137 £0.22 £1.00 BD243€ £0.40 BU20B £1.00 BD243€ £0.40 BU20B £0.40 £0.40 BD243€ £0.40 BU20B £0.40 £0.40 BD243€ £0.40 BU20B £0.40 BD243€ £0.40 BD24			BF870/BF472	TIP30 £0.45
BC559B £0.07 BU126 D.70 TIPA1 £0.27 BC539B £0.18 BU20B £1.00 TIPA2 £0.40 BC640 £0.30 BU20B £1.00 TIPA2 £0.40 BC640 £0.30 BU20B £1.00 TIPA2 £0.98 BD131 £0.50 BU20B £1.00 TIPA3 £0.98 BD131 £0.50 BU20B £1.00 TIPA3 £0.98 BD132 £0.35 BU20B £1.00 TIPA3 £0.55 BD137 £0.35 BU20B £1.00 TIPA3 £0.55 BD137 £0.35 BU20B £1.00 TIPA3 £0.55 BD137 £0.22 £1.00 BD243€ £0.40 BU20B £1.00 BD243€ £0.40 BU20B £0.40 £0.40 BD243€ £0.40 BU20B £0.40 £0.40 BD243€ £0.40 BU20B £0.40 BD243€ £0.40 BD24		BC549£0.07	BU108 £0.25	TIP32 CO 30
B6640		BC559B £0.07	BU126 £0.70	TIP41 £0.27
BD131	1	BC639£0.18	BU208 £1.00	TIP42C £0.40
BD132		RD131 90 50		TIPL791A £1.20
BU2438	i	BD132£0.40	BU208T £1.00	ZTR604 £0.55
BU2438	1	BD137 £0.35		ZTX650 £0.70
BU2438	1	BD238 £0.22	£1.00	
DIODES AND THYRISTORS BA157	1	BD243B £0.30	BU326A£1.00	
BA157	1	BD243C 10.40		
BR100	ı	DIODES AND TH		0.00
BR101 C1 40 BY210-8006WV96 RGP15G C0.45 BR103 C0.75 BR303 C1 50 BY227 C0.55 RGP15J C0.55 BR303 C1 50 BY227 C0.20 RGP15K C0.35 BRY56 C0.75 BY228 C0.50 RGP15K C0.35 BY56 C0.75 BY228 C0.50 RGP15K C0.35 BY56 C0.75 BY16 C0.75 BY16 C0.75 BY16 C0.75 BY16 C0.75 BY16 C0.75 BY16 C0.75 BY29 C0.50 RGP30K C0.70 BY16 C0.75 BY29 C0.50 RGP30K C0.70 BY16 BY29 C0.50 SC64 C6.50 BY16 C0.75 BYV66 C0.50 SC64 C6.50 BY16 C0.75 BYV66 C0.50 SC603 C1.20 BY17 C0.20 BYV66 C0.50 SC603 C1.20 BY17 C0.20 BYV66 C0.50 SC603 C1.20 BY17 C0.20 BYX6 C0.50 SC603 C1.20 BY17 C0.50 BYX6 C0.50 SC603 C1.50 SC603 C1.50 BY16 C0.50 BY16 C0.50 SC603 C1.50 SC603 C1.50 BY16 C0.50 BY17 BY17 BY17 BY17 BY17 BY17 BY17 BY17	ı	BB100 - 50.20		OT112 F2 20
BR303 C1 50 BY227 0.20 RGP15K 03.55 BRY56 0.75 BY228 01.50 RGP30K 03.70 BT116 C2.60 BY229 01.55 RH 01.30 BT128P C4.50 BY299 01.50 RH 10.10 BT128P C4.50 BY299 01.50 RH 10.10 BT15800R BY95D 01.30 S6264 68.50 BT15800R BY96D 01.30 S6264 68.50 BT158 02.0 BY96B 01.50 S663 12.00 BT127 01.08 BY96B 01.50 S663 12.00 BT127 01.08 BY96B 01.50 S6808 01.20 BT127 01.08 BY9710 01.50 S6808 01.00 BT133 01.00 BY76B 01.50 S6808 01.00 BT133 01.00 BY76B 01.50 S6808 01.00 BT134 01.00 FB2506 01.50 S6808 01.00 BT1464 01.00 FB2506 01.50 S6808 01.00 BT1464 01.00 FB2506 01.50 S6808 01.00 BT1464 01.00 FB2506 01.50 S6808 01.00 BT1584 01.00 BY76B 01.50 S6808 01.00 BT1584 01.00 BY76B 01.50 S6808 01.00 BT1684 01.00 BY76B 01.50 S6808 01.00 BT1684 01.00 BY76B 01.50 S6808 01.00 BT1684 01.00 BY76B 01.50 S6808 01.00 BT168 01.00 BY76B 01.00 BT188 01.	ı	BR101 £1.40	BY210/800/BYV96	RGP15G £0.45
BPY55		BR103 £0.75	£0.55	RGP15J £0.55
BT128P £4.50 BY299 .0.50 RM11C .00.45 BT129P £4.50 BY96D .00.30 S0264 £8.50 BT151600R BY96D .00.55 S6613 £12.00 BY96D .00.55 S6613 £12.00 BY96D .00.55 S6613 £12.00 BY1265 £0.50 SKB02 £0.50 SKB02 £0.50 SKB02 £0.50 SKB02 £0.50 SKB02 £0.50 SKB02 £1.00 BY127 £0.08 BY170 £0.50 SKB02 £1.00 BY133 £0.20 BYX55600 £0.55 SKB026 £1.50 BY164 £0.90 FB2566 £1.50 SKEU2 £0.00 BY164-SKB202 £0.05 SKEU2 £0.00 BY164-SKB202 £0.05 SKEU2 £0.00 BY164-SKB202 £0.05 SKEU2 £0.00 SKEU2		BRY56 £0.75	BY228 £0.50	RGP30K £0.70
BT15+800R		BT116£2.50	BY229£1.15	RHI £1.30
BT15+800R		BT128P £4.50	BY299£0.50 BY96D £0.30	SG264 C8 50
BY127		BT151/800R	BYV96D £0.55	SG613 £12.00
BY127	ı	£1.75	BYW56£0.50	SKB02 £0.60
BY133 D2 20 BYX55-600 D3.55 SKB208 £11.00 BY164-SKB202 IN-4001 D2.06 SKE U.2 D.60 BY164-SKB202 IN-4001 D0.06 SKE IM15 D0.65 BY179 £1.10 IN-4004 D0.06 SKE SKE 26.20 20.65 BY179 £1.10 IN-4004 D0.06 SKE SKE 26.20 20.65 BY179 £1.10 IN-4004 D0.06 SKE SKE 26.30 £1.30 BY179SK208 IM-4005 D0.10 SKE 26.30 £1.30 BY179SK208 IM-4005 D0.10 SKE 26.70 £2.20 BY189 £1.10 IN-4006 D0.08 SKE 4F1-06 £0.45 BY184 £0.65 IN-4007 D0.08 SKE 4F1-06 £0.45 BY189 £2.00 IN-418 D0.10 SR2M £0.75 BY190 £2.00 IN-418 D0.10 SR2M £0.75 BY190 £2.00 IN-408 D0.25 P3053V £1.40 BY223 £2.00 KBL08 £1.95 F3064V £2.28 ASK FOR SEMICONDUCTORS NOT LISTED	ı	BY127£0.08	BYX10 £0.50	SKB2/02£0.90
BY154-SK8202 N-4001 C 0.0.66 SKE IM15 . 00.65 BY179 C 11.10 N-4002 C 0.0.6 SKE 26202 C 00.75 BY179 C 11.10 N-4004 C 0.0.10 SKE 26304 C 13.00 BY179SK208 M-4005 C 0.10 SKE 26304 C 13.00 BY179SK208 M-4005 C 0.10 SKE 26704 C 13.00 BY184 C 0.65 N-4007 C 0.0.68 SKE 4F1-06 C 0.45 BY184 C 0.65 N-4007 C 0.0.68 SKE 5F2-10 C 22.00 BY189 C 2.00 IM4148 C 0.10 SF2.M C 0.75 BY190 C 2.0 IM4184 C 0.25 BY190 S 0.75 BY190 C 2.00 IM4184 C 0.25 BY190 S 0.75 C 1.40 BY223 C 2.00 KBL08 C 1.95 T 9064V C 2.28 ASK FOR SEMICONDUCTORS NOT LISTED	ı	BY133£0.20	BYX55/600 £0.55	SKB208£1.10
\$M.90 NA002 \$M.002 \$M.002 \$M.002 \$M.004 \$M.010 \$M.004 \$M.010 \$M.004 \$M.010 \$M.005 \$M.004 \$M.010 \$M.005 \$M.005 \$M.005 \$M.005 \$M.005 \$M.005 \$M.005 \$M.005 \$M.006 \$M.008 \$M.008 <th>ı</th> <th>BY164£0.90</th> <th></th> <th>SKE 1/02 £0.60</th>	ı	BY164£0.90		SKE 1/02 £0.60
BY179SK208 IN-1005	ı	£0,90	IN4002 £0.06	SKE2G2/02 . £0.75
BY184 00.65 IN4006 00.08 SKE4F1/06 00.45 BY189 00.65 IN4007 00.08 SKE5F2/10 02.20 BY189 02.00 IN4148 00.10 SR2M 00.75 BY190 02.00 IN4408 00.25 BY190 00.75 BY190 0	ı	BY179£1.10	IN4004 £0.10	SKE2G3/04 . £1.30
BY199	١	£1,10	!N4006 £0.08	SKE4F1/06 £0.45
BY190 £2.00	١	BY184£0.65	IN4007 £0.08	SKE5F3/10 £2.20
BY223£2.00 KBL08£1.95 T9064V£2.28 ASK FOR SEMICONDUCTORS NOT LISTED	J	8Y190 F2 nn	IN4148 £0.10	5H2M £0,75 T9053V £1.40
1000000000	١	BY223 £2.00	KBL08£1.95	
VIDEO HEADS	1	ASK FOR SE	MICONDUCTORS	NOT LISTED
I VIDEO HEADS	1			
		ı vin	EN HF/	ANS

NEO UEADO

AMSTRA0	
3HSSR-VCR7000 (Saisho Orion)	£18.00
PSF1-VCR4500,5200,9000	
PSF2-VCR4600,4700	
PSF3-VCR6000	£21.50
FERGUSON	
3HSSV-2 Head universal	£7.50
3HSSVA-3V42,44,45,46 etc	
3HSS4VC-3V48/HRD565	
3V48,58,59,65,FV10,11	120.00
12,13,14,20,21,26	
And most other Fergusons	POA
HITACHI	
3HSSHA-VT8000,9000 series	617.00
3HSSHB-VT11.33 etc	£17.00
3HSSHB-VT11,33 etc 10082-VT120,220	£29.00
10081-VT130,135	£30.50
PANASONIC	
3HSSN-2 Head universal 3HSSU1N-NV100,370,380/Philips VR6460	£7.50
3HSSU1N-NV100,370,380/Philips VR6460	£11.00
i 3HSSU2N-NV230,470,480,G9,10.	
11,15PX 3HSSU3N-NV430,460	\$21.00
3HSS3N-NV777.330	£16.00
3HSS4NB-NV7730	
3H\$\$4NA-NV366	624 00
3HSS4NA-NV366 NVG30,33,40,45.46,130, & most	
other Panasonics	POA
SANYO	
3HSSSY-VHR1100,1110,1300	£20.00
3HSS3SY-VHR1500	£34.00
SHARP	
3HSSSP-VC9300,9500.9700,381,481,	
482,483,486 etc	£17.00
3HSSSPB-VC581,583,651,670 etc	£17.00
VC7000,8000 series (Brass)	£42.00
OTHER MAKES	
Alba 4000, Goldstar 8000, Sentra 8000,	
1000 Fisher FVHP510,520,530,615,710 etc	£22.50
Fisher VBS7000,9000 etc	
Hinari VXL2,4,3,20,25	C18 00
Hinari VXL5,6,20H	£15.00
Mitsubishi HS306,710	£30.00
Mitsubishi HS306,710 Orion VC150,180,VH1,2,3 etc	£18.00
Saisho VR100,605,705,805,905	£18.00
Samsung Universal 2 Head	£24.25
Toshiba V71,73,74,75,81,82,83,84,85,87	COU UO
Toshiba V93	C21 AA
ASK FOR VIOEO HEADS NOT LISTED	421.00
The above heads are new.	
ine above neads aid fiew.	

BELT KITS	V\$310/315/320/380/
Belt Kits for most models	385 2.40
are stocked. Some	Ask for models not listed.
examples are:	HITACHI
AKAI .	VT11/1417/19/33/34/35/
/S1,2,5 1.20	38/39/88 1.30
/\$4,6,9,15 1.10	VT8000/8500 1.00
Ask for models not listed.	VT9300-9500-9700 1.00
AMSTRAD	Ask for models not listed.
MSTHAU TVR1,2,3, VCR4600,	PANASDNIC
700,5200 1.90	NV230/250/280/370/380
Ask for models not listed.	430/450/460/465/485/630/
ERGUSONJVC	810/830/850/870/890 1.60
V00/3V16/3V22 etc 1.60	NV300/330/332/333/430/
3V29/3V30 1.20	366
3V35/36/38/39 1.10	NV7000/7200/2000/
IV42/43/44/45/48/53/54	2010 1.50
55/57 1.00	Ask for models not listed.
Ask for models not listed.	PHILIPS
oading betts on certain.	VR6367/6467/6561/6751/
nodels also available.	6760/ 2.25
ISHER	VR646069206520 2.40
VHP520:530 1.00	Ask for models not listed.
VHP615620/622/710/711/	SANYO
'15/716/72 0/721/ 725/830/	VTC500051506500 0.65
340 1.00	VHR1100/1300/1500 1.00
VHP905906907/908910/	Ask for models not listed.
111/915/916 1.20	SHARP
GRUNDIG	VCF3VC402/500/571/581/
/S400/410/440/450/	582/583/584/585 1.10
	VC9300-9500-9700 1.95
/S180/200/220/2 6 2/	VC8000-8300 1.95
65/267 2.20	Ask for models not listed.

Funai, GEC, Goldstar, Granada, Grundig, Hinari, ITT, Mitsubishi, NEC, Orion, Saisho, Samsung, Schneider, Sony, Tensai etc. NEW LINES

NEM TINES		
LOPT Hitachi CPT1476	£18.00	
LOPT Hitachi CPT2276 etc	£19.00	
LOPT Matsui 1440	£18.00	
Trip Grundig CUC2401 etc	£17.00	
OTHER GRUNDIG TRIPLERS IN STOCK		

LINE OUTPUT TRANSFORMERS

Decca 100

ITT CVC20	12.50
ITT CVC25/30/32	
ITT Compact 80 Series 110	16.75
ITT Compact 80 Series 90	19.75
ITT CVC45	18.00
ITT 1109F	14.00
ITT CVC1204	11.50
ITT CVC800/1/3	21.50
ITT CVC1100	
ITT CVC11501175	20.00
ITT 6325	18.50
ITT 3546	18.50
ITT 1200/1	
Other ITT transformers avaliable	
Fidelity all models up to 20" ZX3000	10.50
Fidelity Panel for ZX2000	
Fidelity 22" ZX3000	24.50
Hinari CT4/5 & TVA1	
Philips KT3	
Rank Bush T20A	
Thorn TX100 Green Spot 110	
Ferguson TX90 LOPT	17.75
Ferguson 3V35/36 Mains Transformer	
Ferguson 3V44/44/45 Mains Transformer	18.85
Sony – Please state model for price	
Universal Tripler	4.75
Universal Tripler with focus unit	
Decca 120/130 series tripler	
Thorn TX10 Focus Unit Kit	
Hitachi and Matsui LOPTs in stock	
VIDEO MOTORS	
REEL MOTORS	
	£20.00
Ferguson 3V58,59,65,FV10,11,12,13,	
14,20,21,22	
Ferguson FV260	
Hitachi 8000 8300 8500	£8 50

. orgason 0+2000	
Ferguson 3V58,59,65,FV10,11,12,13,	
14,20,21,22	£17.25
Ferguson FV260	£14.50
Hitachi 8000,8300,8500	£8.50
Sanyo VTC5000,5150,5400,5300,6500	£7.50
Sharp VC9300, 9500 etc, Original	£15.00
Panasonic NV333,366 Original	£13.20
All other Panasonics	POA
CAPSTAN MOTORS	
Ferguson 3V35,36 Original	£22.50
Ferguson/JVC (Mechanical models)	£20.00
Hitachi VT11 Original	
Hitachi VT33 Original	£32.00
Hitachi VT64 Original	£19.75
Hitachi VT8000 series Original	£34.50
Hitachi VT9000 series Original	£34.50
Sharp VC7000 series Original	

MODE CONTROL MOTORS Ferguson 3V42,43,44,45,48,49,52,53 26.00 Ferguson 3V58,59,65,FV10,11,12,13,14, 20,21,22,26 €4.50 Sharp Reel Motor Pulley only...... £1.20 Replacement of plastic pulley on a number of Sharp Reel Motors with the above metal nulley gives better rewind/FF

above metal pulley gives better rewinder	XXXXXX
performance.	-
IDLER ASSEMBLIES	
FERGUSON	
Take up Clutch (Mechanical models)	£5.00
3V29/30 Take up Idler	
3V29/30 Take up Clutch	£2.85
3V29/30 Reel Idler	£3.00
3V35 Reel idler	
3V35,36,38,39 Take up Clutch	
3V58,59,64,65,FV10,11,12,13,14 ldler Arm	£1.80
Clutch Assembly 3V44,45,48,49,52,53,	
54,55	
Clutch Assembly 3V42,43	£14.00
FISHER	
FVHP615,905,910, Idler Assembly Original	£5.00
FVHP615 Gear Idler Assembly	£4.35
FVHP905,910 Gear Idler Assembly	£5.00
FVHP520,530 Idler	£3.00
FVHP520,530 Pulley	£0.70
HITACHI	
VT11,33 etc. Original Idler Arm	. £2.50
VT11,33 etc. Idler Replacement	£1.75
VT9300,9500 etc. Play Idler	., £3.65
VT9300,9500 etc. F/F Idler	
VT9300,9500 etc. Idler	
VT8000,8500 etc. F/F Rew Idler	
VT800,8500 etc. Play Idler Assembly	
VT8000.8500 etc. FF/Rew Pulley	. £0.70

VT8000,8500 etc. Ft/Rew Pulley	£0.70
VT11,33 etc. Clutch Assembly	£8.00
PHILIPS	
VR6460,6920 Idler Arm (Original)	£3.00
DV464,6462,6463,650 etc. Idler Mod. Kit .	£4.50
VR6542,6843 Reel Idler	£6.50
VR6542 Reel Drive Pulley	£7.75
VR6843 Reel Drive Pulley	£9.50
PANASONIC (All Original)	
NV370 Idler Arm Unit VXP0521 Gen.	£3.00
NV8600,8610 Play Idler VXP0243	£0.95
NV332,777,788 Idler Unit VXP0463	£3.00
NV600,688 Idler VXP0515	£3.00
NV333,366 Idler Arm 2 Unit VXL0997	£10.50
NV8400,8600,8610 etc. VXP0245	£0.95

FB 98

£1.10

POA

£5.50

65 00

£1.75

From £1.50

All Panasonic Maintenance Kits... QUOTE PANASONIC PART No. FOR PARTS NOT LISTED

NV333,366 etc. Idler VXP0401-NV700,7200,

NV2000,3000 Play Idler VXP0331-NV2000,3000 Idler Unit VXP0329.

7800 Idler VXP0344

Back Tension Bands ...

Idler VHR1100.1300.1500.

SANYO

lc

dier VHR2100,2300,2500,2700	£5.50
Reel Drive Pulley Unit VTC5000,5150,6500	£5.00
der Roller Assembly VTC5000,5150,6500	£2.25
HARP	
tler VC9300,9500 etc.	£1.75
dler VC481,581 etc.	£1.95
tler (original) VC9300,481,581 etc.	£3.50
dler Assembly (original) VC651,681,685	£6.50
der Assembly (original) VC780,781,785,787,	
93,VCT72	£6.50
MSTRAD	
COO ACOO MOD WIT INCLUDED DINOL	

AMSTRAD
4500,4600 MOD KIT INCLUDES PINCH
ROLLER AND IDLER CLUTCH
Limiter Post Assembly
Makes & Models: Hinari VXL4,

Matsui VX730,735,735A,755,770. 800A,810,820,880,990. Saisho VR1100,1200,1200HQ,1600,2500, 3200,3300,3300X,3500,

IOLERS FOR AKAI, SAMSUNG. MITSUBISHI, NEC, ETC. IN STOCK

Prices subject to change without notice. Please add £1.00 per order for p&p and then add 17.5% VAT. **REMOTE CONTROLS**

Ferguson, Grundig, ITT, Philips, Pye, Sony, Hitachi, Matsui, Logik, Panasonic, Saisho, Salora, Samsung, Tashiko, Tatung, Toshiba. Various models TV & Video From £14.50 ..From £14.50 MANY HITACHI TV REMOTE CONTROLS NOW IN STOCK.

SONY REMOTE CONTROL RUBBER PADS. STATE MODEL FOR PRICE.

011112 1110222 1 0111 1 11102	
New Additions	
Universal Remote Control	£25.00
Sony type RC670, RM670, RM673	
Sony type RC661, RM652, RM654 RM657,	
RM663, RM664, RM651	£15.50
Panasonic Models TC2110, 2255, 2655, 2680),
TX1752, 2251, 2656, 5500	
Panasonic Models TC1632, 1642, 2232, TX26	
2044, 2200, 2234, 2244, 2636, 3300	£14.50

TV ON/OFF SWITCHES

ITT, Philips, Decca, Thorn, Fidelity, Grundig, Sony and Hitachi. State model for price.

PINCH ROLLERS

A range of Pinch Rollers is in stock, most of them A range of Princh Notices is a stock, miost of them @ 22.80. Makes include Akai, Amstrad, Ferguson, Fisher, Funai, GEC, Goldstar, Grundig, Hinari, Hitachi, ITT, JVC, Marantz, Mitsubishi, NEC, Nordmende, Orion, Panasonic, Philips, Samsung, Sanyo, Schneider, Sharp, Sony, Tensai, Thomson, Toshiba etc. Please state model and make.

Philips Pinch Roller for models VR6180, 6185, 6285, 6362 6367, 6467, 6468, 6470, 6561, 6670, 6760, 6761, 6870

OTHER SPARES	
Universal Video Copying Kit	£4.25
Universal Copying Kit (Scart)	£5.20
Universal Camcorder Kit	€6.90
Video Cassette Lamps from	£0.50
CRT Anode Caps	£0.60
Video Tape Splicing Kit	£6.95
Hitachi TV Frame Module HM6251	£5.50
Hitachi TV Frame Module HM6232	£5.50
Cassette Housing Assembly Ferguson	
3V35,36,38,39,42,43,44	£25.25
Cassette Loading Roller Assembly 3V23,3V3	1,
3V32	€3.50
Philips 1.2V Back up Battery	£1.75
Philips 2.4V Back up Battery	
5.5V Back Up Cap	£1.85
Degaussing Positor Blue	£3.00
Degaussing Positor White	£1.30
Cassette Housing Assembly Hitachi VT11	£19.50
End Sensor for Hitachi VT63,64,65 (Pair)	. £2.75
Cassette LED Sensor for Panasonic etc	£1.60
.C. Circuit Protectors	. £0.60
Clear Service Cassette	£5.90
Push Button Unit Thorn TX90	£12.75
Matsui/Saisho Limiter Post	
Cassette Housing Modification Kit for	
VCA113HM Series. Includes cassette swit	
star sensor PCB. Fault symptom No (
ntermittent load/untoad	
Video Idlers Spring Kit	£5.95
video Washer & E Clip Kit	
Universal Video head Puller	£16.00

MANY OTHER VIDEO AND TV SPARES IN STOCK

Back Tension Bands in Stock for Akai, Fisher, Hitachi, Ferguson, JVC, Mitsubishi, Panasonic, Sanyo and Sharp.

Maintenance Kits available for Alba, Amstrad, Ferguson, Fisher, Goldstar, Goodmans, Granada, Hinari, Hitachi, JVC, Matsui, Mitsubishi, Nikkai, Panasonic, Philips, Saisho, Salora, Schneider, Sentra, Sharp, Sony, Tashiko, Toshiba.

RESISTORS, ELECTROLYTIC CAPACITORS, FUSES ETC. NOW IN STOCK.

SEND FOR PRICE LIST. ☆ ☆ ☆

Trade Counter now open Monday-Friday 9.00-5.30. Saturday 9.00-1.00. Nearest Underground Station — Southfields District Line.

Same day deliveries of stock items in S.W. London areas available. Please telephone for details.



18 BROOKWOOD ROAD, SOUTHFIELDS, LONDON SW18 5BP. TEL: 081-877 3492/877 3518. FAX: 081-877 3518.





TVs, VCR WHOLESALER

ONE AND ONLY THORN APPROVED WHOLESALER **MANCHESTER BOLTON FOR THE NORTH WEST**

WORKING and UNTESTED PRICES TO SUIT YOU!!

VCRs

* TOP LOADERS	From £35
* FRONT LOADERS	From £55
* NEW VIDEOS	P.O.A.

TVe

. 43		
* BASIC TVs	From	£10
* TELETEXT TVs		
* STEREO TEXT	From	£60
* FST TVs		

•	The second secon
* NEW R/C HANDSETS	From £7.50
	£14.50
BIC HANDSETS	70p
* NEW R/C HANDSETS * VCR 3V35 CARTRIDGES	99p
* NEW R/C HANDSETS * VCR 3V35 CARTRIDGES * VIDEO BELTS Fits 3V35-3V36'S * VIDEO TAPES E180	£1.10
* VIDEO BLE * VIDEO TAPES E180 * FILM CLEANERS	
* VIDEO LEANERS	
* FILIN	ELECTRONIC



ILEX PLC



MAIN DISTRIBUTORS

ALL PRICES SUBJECT TO QUANTITY & VAT

LOOK FORWARD TO '92 WITH CHROMAVISIO

TRAILER LOADS DIRECT. FROM SOURCE ARRIVING **EVERY WEEK**

0204 363728 Ask for Lal

Tel. 061-736 6333 **Ask for Sash**

AM	STRAD . HII	NARÍ -	LOGIK • J.\	۷.C. •	SONY .	MATSUI .	FIDELITY .	GRUNC	
E	VIDED HEAD	OS	MEMOREX	040.05	VT64/65	£1.20	VCR4500/4600 VCR4700	£10.95 £16.59	MATSU
	AKAI		1000/1700 MITSUBISHI	£18.95	PANASONIC NV333/370/7	30 £1.50	VCR6000/6100	\$24.95	S
SHARP	VS1/2/3/5	£8.25	H\$300/301/302	£19.25	NV7000/720		DECCA/TATUNG		
I ₹ I	VS4	29.95	H\$303/304/370	£22.75 £22.75	PHILIPS	04.75	145/150/160 FERGUSON	£12.95	
돐	VS6/8/9 VSX9	£29.95 £29.95	H\$700 H\$306/307/H\$318/71		VR6460/6460 SAMSUNG	£1.75	TX9/10/100	£8.95	2
	VS35/37	£29.95		£22 95	510/910/520	£1.95	TX9/10/100 Text	£8.50	J.V.C.
LOGIK	VS512 ALBA	€29.95	HSB10/20/30 NIKKAI	€29.95	717/730/750	£1.95	TX10/100 Prof 3V23 VCR	£10.75 £8.50	
ğ	VCR 4000	£15.95	NVR100/500	£18.95	GDLDSTAR GHV8000	£1.95	3V35/39	19.95	
2	5000/6000	£15.95	OSAKI		VCP4000	£1.95	3V58 VCR (Origina		SONY
	AMSTRAD	£11.95	V20H/25 PANASONIC	£19.95	HINARI		51KS (ICC5)	£14.95	₹
AMSTRAD	VCR 4500/5200 7000/9000/TVR1	£11.95	NV2000/7000	£6.25	V20H/VTV10 VXL3/4/10/1		TRANSFOR	MERS	
2	VCR 4600/4700	£11.95	NV333/7200	€6.25	19/20/25/35	£1.95	THÜRN		FIDELITY
<u> </u>	6000/6100	£15.75	NV370 NV180	£12.95 £24.95	MATSUI	** **	TX100 Green Spot TX100 White Spot	£13.50 £16.95	ЖI
ž	VCR TVR2/3 FERGUSON	£15.95	NV366	£23.95	VXL 730/735 800/820/880	£2.95 £2.95	FIDELITY	110.30	
۷.	3V29/30/35/36	£8.25	NV688/730	\$26.95	SAISHO		HINARI CT4/5	£12.95	₹.
in	3V44/45	£15.95 £15.95	NVG10/25 NVL23/25	£19.95 £24.95	VR1000/120		4515-01-01	£16.95	
PHILIPS	3V54/55/56/57 3V58/FV13H	£15.95 £22.75	SAISHO	124.95	VR2000/300 AND MANY		4515-03-19	£15.95	ALBA
21	FV20B/21/22/26	£19.95	VR605/705/805	£13.45	_		BUSH LOPT		σ.
푼	FV30/32/FV13H FIDELITY	£29.95	VR905/100 VR1100/1 200	£13.95 £13.95	IDLER	S TAKE UP	2020	£19.95	
	VR100/VTR1000/100	1	VR3200/3500	£14.69	AMSTRAD	LUTCH	Phone for mor	e details	
O	***************************************	£18.95	VR3300	£14.69	VCR7000	£1.95	Enclose £1.50 p	&p + VAT	×
ā	FISHER	240.05	VR3300X/3600	£15.95	ALBA 4000	£2.85			존
3	520/715/720/905 GOLDSTAR	£12.85	V1510/520	£16.95	FISHER FVHP920 Idl	er £2.25	TRANSISTO	RS ICS	ű
GRUNDIG	GHV21/1221/12321	£17.85	V1730/750	£16.95	FVHP615/71		Appointed distri	butors for	우
	VCP4000/4100/4200		SANYO	P46 26	Gear idler As	s £4 95	PHILEX KO	E1.60	PANASONIC
6	GRANADA	£17.75	VHR1100/1200 VHR 1300/2300	£15.25 £15.25	FVHP615/62 Idler Assy Or		AN7161N	£3.75	
PANASONIC	CS1/DS2	£19.95	SENTRA		HITACHI	1g £0.50	BA6209	£1.95	Ω
ō	EH2/EH3/ES2	€24.75	GX5000/8000	£16 95	VT11/33/17/	19	BA6238 BA6239	£1.99 £2.39	GRUNDIG
\$	V20H/VXL2/VXL3	£12.75	SHARP VC381/383/481	£13.75	FFW/RRW IO	ler £2.50	CNX62A	£2.95	Ž
Z	VXL4	£12.75	VC581/582/585	€19.95	VXL2/3/20	£2.95	HA13001	£1.95	무
[₹	VXL5/20/6	£12.75	VC9100/9300	£13.50	LOGIK		HA13118 HA13119	£2.95 £2.95	9
	VXL8/9/10/11 VTV100/200	£19.75 £19.95	VCA100/105 VCA131/140/170	£15.95 £29.95	VR950/VX60 900/910	5 £3.25 £3.25	LA7800	£1.75	
≰	HITACHI	413.33	VCA501/602	\$29.95	MATSUI	13.23	LA7830	£2.20	Ĭ
ALBA	VT11/33	£12.95	VCA801/VCT72	£16.28	VX605/900/9	90 £3.25	M293B1 M490BB1	£6.75	PHILIPS
×	VT17/19 VT8000/8500	£24.75 £12.95	VCA310 SOLAVOX	£16.28	SAISHO	380 £3.25	M490881 M4918B1	£8.45 £8.35	낋
	VT9300/9700	£12.95	NVC R1000/5000	£16.95	VR500/605/I 900/1000	£3.25	MDA2062	€3.70	
Ē	VT120/130/250	£19.95	TOSHIBA	845.05	2000/2500	£3.25	SAA1293-2	£9.95	≥
	VT145/530 VT150 Four Head	£29.45 £29.95	V63/4/71 V75/81/82	£15.95 £15.95	PHILIPS VR6467		S K5481	£4.75 £3.95	S
FIDELITY	JVC		MANY MORE	210.50	Rack Slider	£8.25	STR4141 II	25.95	AMSTRAD
	HRD 110/120	€825	DELT VIT	2	Any Pinch R	oller £2.25	STRD1816	£7,75	\$
	HRD 140/143 HRD 150/157/158	£15.95 £16.95	AMSTRAD	1 10	Amstrad Mo	d Kit £4.75	TDA4601	£3.35	
Ž	HRD 170/180	£19.95	4600/4700	£1.95	REMOT	CONTROLS	SONY SWITCH RC	£3.95	
SONY	HRD 230	€19.95	5200/TVR1/2/3	£1.95	AMSTRAD		SCART TO SCART	£3.95	LOGIK
65	HRD 250/370 HRD 430	£26.75 £26.75	VR6000/6100 FERGUSON	£2 25			MANY M		Ω
	HRD 470/530	£32.95	3V29 Loading Belt	£0.25	VCA		Enclose £1.50 p8 le Compon		ᄌ
J.V.C.	HRD 725	£32.95	3V29/30 Belt	20.99 20.79			ne, Small Heath		(0
	VR 950/955/960	£16.75	3V35/36/44 FISHER	10.79			ne, small Neath ham 89 5QG	'	SHARP
	MATSUI		FVN520/710/725	£1.15			021-772 2834	MSA	S.
5	VX730/735/755 VX755/755A/850	£14.95 £15.75	FVN905/910 HITACHI	£1.15		Fax 02	1-772 7487		ס
ATSUI	VX/55//55A/85U VX880A/770B	£15.75 £15.95	VT11/17/19/33	£1.20		SAME DA	Y DESPATCH	- 6	
\$									EL
PA	NASONIC	ITT . S	SHARP . PH	ILIPS	· LOGIK	· AMSTR	AD & HINAR	I . MAT	้าบล
	TASONIO -		A DATE		L.C.C.IIIX	All Cart	Name and Address of the Owner, where		

ST CLEMENTS

TV Wholesale

Most makes ex rental T.V.s and videos BEST POSSIBLE PRICES

> New stock arriving weekly. 30 Minutes from

Peterborough, Cambridge and Bedford.

RING KEITH ON

0480 52539

FOR OPENING OFFERS

Opening 21st February 1992

142 HIGH ST, HUNTINGDON, CAMBS.

AERIALS

FOR TV & FM RADIO, PLUS 1000's OF MASTS, BRACKETS, LASHING KITS, CLAMPS, PLUGS, CABLES, OUTLETS, DIPLEXERS ETC.

AMPLIFIERS

FOR DISTRIBUTION SYSTEMS AND DOMESTIC, MAST HEAD OR SET BACK. WE HAVE ONE OF THE LARGEST RANGES, AVAILABLE FROM STOCK

MAIN DISTRIBUTORS

FOR ANTIFERENCE, LABGEAR, WOLSEY FRINGE, TRIAX, TELEVES, VOLEX-RAYDEX, KUBLER + MANY MORE

COASTAL AERIAL SUDDINES

UNIT X2 Rudford Industrial Estate Ford, Arundel

0903 723726



NO MINIMUM ORDER VALUE NEXT DAY DELIVERY ACROSS UK CARRIAGE FREE ON ORDERS £100+



ARE YOU HAVING TROUBLE GETTING HOLD OF YOUR REGULAR COPY OF TELEVISION? IF SO, WHAT ABOUT TAKING OUT A **SUBSCRIPTION?** FOR MORE DETAILS, PLEASE RING OUR SUBSCRIPTIONS DEPT. ON: 0444 441212 **Ext. 5320**



QUALITY USED T.V. & VIDEO

COMPLETE RANGE OF T.V.'s AND VIDEOS MOST MAKES AND MODELS AVAILABLE

STOCK ARRIVING DAILY T.V.'s from £3.00 Videos from £30.00 Prices Ex-VAT

Free Delivery Service to most areas of the U.K.

UNIT 80, BARRACKS ROAD, SANDY LANE INDUSTRIAL ESTATE, STOURPORT-ON-SEVERN, WORCESTERSHIRE DY13 9QB Just 10 Mins from M5 Junct. 6 Worc's North

For your export requirements contact us.

02993-79642 or 79643 FAX: 0299 827984

CREWE WHOLESALE TV LTD.

OUR SPECIALITY IS SUPPLYING TRADE CUSTOMERS WITH TOP NAME WORKING TV'S AND VIDEOS. OUR LARGE SELECTION OF EXRENTAL TV'S & VIDEOS ARE OF EXCELLENT QUALITY. WITH DISCOUNT FOR QUANTITY, YOU WILL FIND OUR KEEN PRICES HARD TO BEAT. WE HAVE NEW STOCK ARRIVING EVERY WEEK. RING NOW FOR A PRICE LIST. WITH OUR FRIENDLY STAFF AND PERSONAL SERVICE, YOU CAN'T MISS THE CHANCE TO COME AND SEE FOR YOURSELVES.

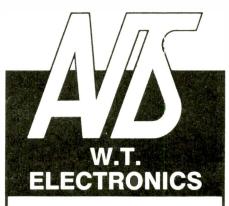
TEL: 0270 582924 WILLIAM STREET CREWE, CHESHIRE

UNIT 2

WHY NOT COME AND SEE OUR EXCELLENT SELECTION OF UNTESTED TOP NAME, TV'S AND VIDEOS. NEW STOCK ARRIVING EVERY WEEK. COMPETITIVE PRICES AND DISCOUNT FOR QUANTITY. PHONE NOW FOR CURRENT STOCK LIST, AND PRICES.

TEL: 0254 64489 SCHOOL LANE GUIDE, BLACKBURN

DELIVERIES CAN BE ARRANGED

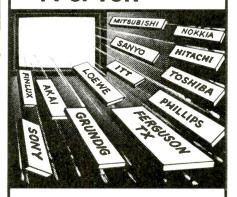




NICAM STEREO

INTEGRAL CIRCUITS

For ALMOST ANY TWIN SPEAKER TV or VCR



- Simple installation—fully assembled and pre-aligned circuits.
- Personality modules for individual TV sets, when required.
- Full fitting instructions—plus technical support, if needed.
- Twelve months warranty for components.
- Can be fitted to many VCRs.
- Suitable for Scandinavian PAL B.
- Immediate despatch from stock.
- Trade Prices: 1 off £78.00, 5 off £68.00, 10 off £65.00, plus VAT.

UNIT 2, TONBRIDGE WORKS, TONBRIDGE ROAD, HAROLD HILL, ROMFORD, ESSEX RM3 8XJ Telephone: 04023 81863 Fax: 04023 81243

Direct Loads – No Problem Sonic House Abberley Street Smethwick Birmingham B66 Tel: 021-565 1727 Fax: 021-555 5367



Preston Branch: 34 Roman Way, Longridge Road Ribbleton, Preston PR2 5BB, Lancashire Tel: 0772 655011

EXCELLENT RANGE OF TV & VIDEOS

PHONE NOW

Buy what you can sell, just don't decorate your shop with expensive sets

T.V. £15

PHONE NOW BE SENSIBLE PHONE NOW

VIDEO £50 FROM

021-565 1727

EXPORT ENQUIRIES WELCOME

0772-655011

ALL PRICES ARE SUBJECT TO 171/2% VAT

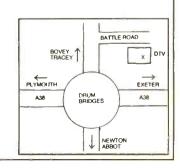
DEVON Tv & VIDEO

UNIT 7, ANCHOR BUILDING, BATTLE ROAD, HEATHFIELD IND. EST., NEWTON ABBOT PHONE 0626 835900

IT'S HERE!

A TRADE WAREHOUSE WITH CLEAN STOCK, SENSIBLE PRICES, FRIENDLY, HELPFUL SERVICE **AND** IT'S RIGHT NEXT TO THE MAIN A38 AT HEATHFIELD INDUSTRIAL ESTATE.

LESS TRAVELLING TIME MEANS
MORE SELLING TIME FOR YOU!
POP IN AND SEE US
- YOU WON'T BE DISAPPOINTED!



Verter Pentilon Control of the Pentilon Control of the

WILTSGROVE LIMITED

TV VIDEO & SPARES COMPONENTS DISTRIBUTORS







THIS MONTH'S SPECIAL OFFERS (DON'T MISS OUT!!!)

SPARES

Giving you the Edge in Sales!

LOPTS

FERGUSON TX100 Series (any LOPT) (Green Spot), (Blue
Spot), (Red Spot), (White Spot) £1 FIDELITY 14" up to 20" (FC201SBE)	3.9
FIDELITY 14" up to 20" (FC201SBE)	9.50
HINARI CT45/TVA1 £1	3.9
TX10 Cropper Transformer	4.50

SEMICONDUCTOR

BU 508A	
TDA 3654	£1.85
STK 5481	
STR 50103A	£3.10
TDA 4600-3	
TDA 2600	£3.95
1DA 2000	

SERVICE MANUALS

TV

1 V	
PHILIPS 2A Provisional Technical Data	£3.00
PHILIPS KT3	
ITT/NOKIA FX4030/CT5110 (Solara 21C60)	£3.00
TOSHIBA CT2020B1	£3.00
FERGUSON 51LB I.C. C5 Service	
Infomation	£2.00
SONY CAMERA CCD-V8AF Service	
Manual	15.00

VIDEO

JVC HRD-180E	£6.00
SANYO VCR VHR2300	.£6.00
OSAKI VCR 33	.£6,00
ITT VR3938	£6.00
ITT VR3929	
TOSHIBA V83B	
SONY EV-S600	
JVC HRD725	
JVC HRD225K	
JVC HRD755EK	
JVC HRD7655EK	
LOEWE CIC 420	
THORN 8930 (3V30)	
THORN 8941 (3V31)	
THORN 8942 (3V32)	
THORN 8943 (3V36)	
THORN 8944 (3V35)	
THORN 8945 FERGUSON 3V24	
FERGUSON 3V24 FERGUSON 3V48	
FERGUSON 3V48	
FERGUSON 3V5455	
FERGUSON 3V59	£6.00
FERGUSON 3V65	
FERGUSON FVII	
FERGUSON FV12	
FERGUSON FV20B	
FERGUSON FV30B	
FERGUSON FV33H	
GRUNDIG VS400	
0101.010 .0100	

SATELLITE MANUALS

AMSTRAD SRD400	£4.00
FERGUSON SRA1	£4.00
ITT/NOKIA SAT1100	£4.00

Why Us?

Wiltsgrove Ltd has 14000sq ft of wholesale floor area which includes TV, video spares counter. Engineering dept & test bench facilities with showroom area of brand new & used stock of TV's & video's on display.

So from direct loads of ex rental & B grade & new branded stock of TV's & video's.

Backed by UK's largest importers Philix & Konig, we are now firmly established as the main outlet in the Midlands for TV & video spares.

Also mailing list to keep you posted.

Stock orders can be allocated & processed at your request.

Fast delivery on spares.

VIDEO HEADS

FERGUSON 3V29/30 THORN 8930/40 VHD-2511 FERGUSON 3V35/36/38 THORN 8943/8944

VHD-2647 £6.50

SERVICE AIDS

BLACK VINYL 15 Metre long 45cm wide .	.Only £13.50
SPRAY PAINT MATT BLACK ROLLS ROYCE SILVER	
SOLDER 500g 1.2mm PRIMA	£4.75
VIDEO HEAD PULLER	£14.95

VIDEO SPARES

FERGUSON 3V35 CASSETTE HOUSINGFERGUSON 3V35 CAPSTAN MOTOR HITACHI VT11. VT33 CAPSTAN	
MOTORSHARP VC383 FRONT FACIA	£14.95
FERGUSON 3V24 FRONT FACIA THORN 8930 FRONT FACIA THORN 8940 FRONT FACIA	£14.95
THORN VC121 FRONT FACIA THORN VT430 FRONT FACIA HITACHI VT8000E FRONT FACIA	£9.50

TV REMOTE CONTROLS PHILIPS RC5 UNIVERSAL IR9005 £11.50 FERGUSON TX10 TEXT TR-RC732 £7.50

1,000s OF MORE SPARES AVAILABLE IN STOCK

EX-RENTAL

RE-GUNT.V. TUBE K56-540X	£40
TELETEXT WORKING COLOUI	R TV From £35
PORTABLE WORKING COLOU 14"	RTV From £39
VCR TOP LOADER Working	From £45
VCR FRONT LOADER Working with R/C	From £60
HRD 750 EK with hand set	0100

EX-RENTAL FST TV IN STOCK

NOW IN STOCK
BRAND NEW TVS – VCR AND
PORTABLE 14" COLOUR RC AT A
VERY SPECIAL PRICE!!!

NOTE: ALL REMOTES ARE EXTRA. STOCK SUBJECT TO AVAILABILITY. ALL PRICES SUBJECT TO VAT PLUS CARRIAGE

WE WOULD ALSO LIKE TO ANNOUNCE THE APPOINTMENT OF MR. RICHARD SHAW AS OUR NATIONAL SALES MANAGER FOR SPARES

KONIG



PHILEX PLC _



£180



28/29 RIVER STREET, DIGBETH, BIRMINGHAM B5 5SA Tel: 021-772-2733 Fax: 021-766-6100

WE ARE SPECIALISTS IN EXPORT



BRITAIN'S LARGEST INDEPENDENT

PRESTON

439 Oakshott Place, Walton Summit Ind. Estate Preston (M6 Junc. 29) Tel: 0772-312101



TV & VIDEO WHOLESALERS

BIRMINGHAM

208 BROMFORD LANE ERDINGTON, BIRMINGHAM B24 8DL Tel: 021-327 3273 Fax: 021-322 2011

CARDIFF

Unit J7, Colchester Trading Estate Colchester Avenue Cardiff CF3 7AP Tel: 0222-471485

THIS MONTH'S SPECIAL FERGUSON FST From £90.00

(ALL PRICES SUBJECT TO VAT)

LONDON

The Royal London Estate, Unit 2, 29-35 North Acton Rd London NW10 Tel: 081-961 5005





WE ARE OPENING A
NEW WAREHOUSE IN
SOUTHAMPTON, SO
WATCH THIS SPACE
FOR MORE DETAILS,
TOGETHER WITH
SPECIAL OPENING
OFFERS



CALL IN AT YOUR LOCAL BRANCH TODAY AND SEE OUR RANGE OF EX-RENTAL AND B GRADE STOCK

EXPORT ENOUIRIES WELCOME



ALL SIZES, ALL MAKES TELETEXT INCLUDED — NON FST £38

Phone: 0222 344754

WE WON'T BE BEATEN ON TV AND VIDEO . . . CALL IN PERSON FOR THE BEST DEAL AROUND.









EXPORT ENQUIRIES WELCOME - ALL PRICES + VAT

REPO TV AND VIDEO TRADE SUPPLIES

DAISY WORKS, 345 STOCKPORT ROAD, LONGSIGHT, MANCHESTER M13 0LF

GOOD CHEAP STOCK - OFF THE VAN

IF THE ABOVE INTERESTS YOU PLEASE MAKE CONTACT — WE HAVE A NEW CONTRACT AND REQUIRE TO ESTABLISH TRADING RELATIONS WITH A FEW REGULAR DEALERS BEFORE THE WINTER TRADING SEASON.

WE CAN
SUPPLY A
SELECTION
SELECTION
OF MAKES, MODELS
AND PRICES
FOR YOUR SHOP

PANASONIC Etc TV & VIDEO

WE CONTINUE TO SUPPLY OUR HIGH QUALITY WORKING STOCK SUITABLE FOR SALE OR RENTAL – GOOD PROFIT, LESS HEADACHES.

SPEAK TO TOM POOLE OR BRIAN RICKETTS 061-274 3409/061-273 2854 Fax: 061-273 4486 HERE THE 1 Mile Approx. STOCKPORT ROAD (Main A6) TO STOCKPORT DAISY * REPO * DRIVE IN VAN APPOLO TO Hyde SCHOOL FIELDS SALES MILL McDONALDS



CENTRAL TV WHOLESALE DISTRIBUTION LTD 369 Stratford Road, Sparkhill Birmingham B11 TEL 021-772 1591 FAX 021-766 6383

CTV LONDON Eley Estate, Nobel Road Edmonton N18 TEL 081-807 4090 AX 081-884 1314

- SUPERB RANGE OF TV'S & VCR'S
 - THORN & GRANADA
- DIRECT LOADS AVAILABLE FROM SOURCE

TV'S . VIDEOS . AUDIO MICROWAVES . HIFI

PORTABLES . FSTS . NICAM . FASTEXT

☆ ☆ ☆ STOP PRESS ☆ ☆ ☆ STOP PRESS ☆ ☆ ☆ STOP PRESS ☆ ☆ ☆

NOW IN STOCK QUANTITY OF BRANDED TWIN SPEED VHS VIDEO'S

FULL SYSTEMS AVAILABLE PLUS ALL USUAL ACCESSORIES

Approved Thorn Television Distributor for West Midlands

UNIT 5, THE PHOENIX BUILDING, RUSHOCK TRADING ESTATE, DROITWICH ROAD, NEAR KIDDERMINSTER TELEPHONE: 0299-251522 0836-585829/0860-809673 (24 HR)

SUPPLIERS OF HIGH QUALITY EX-RENTAL TELEVISIONS AND VIDEOS LARGE STOCKS ALWAYS AVAILABLE **ALL AT COMPETITIVE PRICES**

Also available: 'B' Grade Products, Audio, Microwaves and Complete Range of Televisions and Videos **OPEN: MON-FRI — 9.30-5.30**

0299-251522 0836-585829/0860-809673 (24 HR) Fax: 0299-251543

EXPORT ENQUIRIES WELCOME

TELEPRICE

LIMITED

SWITCH ON!

TO QUALITY

EX-RENTAL TV

& VCR. PLEASE

RING FOR DETAILS

AINTREE

UNIT 2, RACECOURSE IND. EST. ORMSKIRK ROAD, AINTREE LIVERPOOL L9 5AL. TEL: 051 530 1285 IAN MAC

AVONMOUTH

5 PORTVIEW ROAD AVONMOUTH, BRISTOL BS11 7LQ. TEL: 0272 235093 KARLA REALE

NOTTINGHAM

UNIT 8, ASCOT PARK INDUSTRIAL ESTATE SANDIACRE, NOTTINGHAM. TEL: 0602 491385 JOHN JEYS

SOUTH LONDON

22 FRANTHORNE WAY, OFF RANDLESDOWN ROAD, BELLINGHAM, LONDON SE6 3BS. TEL: 081-695 0877 JAMES MAYE

LEEDS

ATULVISION;

UNIT F2, COPLEY HILL TRADING EST., WHITEHALL RD, LEEDS LS12 1HS. TEL: 0532 422774 LES CORKE

GLASGOW

9 COLQUHOUN AVENUE HILLINGTON IND. EST. GLASGOW G52. TEL: 041 883 2610 IAN DORAN

SUNDERLAND

9A/B, 94 CARRMERE RD LEECHMERE IND. EST. SUNDERLAND SR2 9TE. TEL: 091 523 5554 BRIAN CADE

FARNBOROUGH

7/8 KINGSGROVE IND. EST. INVINCIBLE RD, FARNBOROUGH HANTS. GU14 7QS. TEL: 0252 540814 COLIN GORDON

BRAND NEW NIKKAI STOCK IN STOCK NOW

VCR SP/LPFrom	n £165.00
25", 28" FST Nicam Fast Text	POA
14" Portable, Remote	
10" Colour Main/Battery, Remote	

NIKKAI MULTISYSTEM TV IN STOCK 14", 20", 21" FST (VHF/UHF) PAL, Secam, NTSC

AMSTRAD DD8900 Double Deck	£279.00
AMSTRAD STV20 CTV with Stereo Satellite F	

NEW (B) GRADED FERGUSON STOCK

NEW 59P7 FAST TEXT	. POA
41P3 FAST TEXT	. POA
68K4BQ FAST TEXT WITH NICAM	
59I 50 Nicam Fast Text	

EXCELLENT RANGE OF EX-RENTAL TVs & VCRs THORN

THORN TX9 BasicPO	THORN FST Stereo/Text
THORN TX9 R/CPO	THORN (FRG ????)
THORN TX9 Text PO	THORN 8940 (3V9) (Stereo)POA
THORN TX10 BasicPO	THORN 8941 (3V31)POA
	THORN 8942 (3V32) POA
	THORN 8943 (3V36)POA
THORN TX10 Stereo/TextPO	THORN 8944 (3V35)
	THORN 8945
THORN FST Basic R/CPO	THORN 8947 POA
THORN EST Toyt PO	

NON-THORN VCRs FROM £35.00

FRESH STOCK ARRIVING DAILY — RING FOR UPDATE ON STOCK

PORTABLES ★ LATE FST IN STOCK **TOO MANY TO LIST**

LARGE STOCKS ALWAYS AVAILABLE

Brand New Handsets for TVs & Videos from only £7.50

* ALL PRICES ARE SUBJECT TO VAT ★ (OFFERS APPLY WHILE STOCKS LAST) ★ OPEN MON.-FRI. 9 a.m. - 5.30 p.m. SAT. 9 a.m. - 1.00 p.m.

WHY TRAVEL THE WHOLE COUNTRY? RING AFF OR AMIN NOW ON DIRECT LINE TO TV WAREHOUSE

LEEDS (0532) 444200 FAX: (0532) 425777 MOBILE PHONE — 0850 326866 — 24HRS

EXPORT ENQUIRIES WELCOME

UNIT 16. TOWER WORKS, 2 GLOBE ROAD, LEEDS LS11 5QG OFF WATER LANE, NEAR HILTON HOTEL. EASY ACCESS FROM M1 & M62 (2 Mins)

NEW FOR EAST ANGLIA

Save time and travelling costs



EX RENTAL TV'S & VCRS

Most makes available Best possible prices

ANGLIAN T.V. WHOLESALE

Rashes Green Industrial Estate Dereham, Norfolk,

Telephone: (0362) 691611

PLEASE NOTE: ADVERT APPEARING IN FEBRUARY ISSUE TELEVISION SHOWED INCORRECT TELEPHONE NUMBER OUR CORRECT NUMBER IS SHOWN ABOVE.

ESTERN

RADE

ERVICES

TV & VIDEO WHOLESALERS **FOR DEVON & CORNWALL**

EST 14 YEARS

SUPPLIERS OF FX-RENTAL TV & VIDEO'S THORN & NON THORN RFMOTE TEXT & VIDEO HAND UNITS SUPPLIED WHERE NECESSARY ALL PRICES SUBJECT TO VAT

DELIVERIES THROUGHOUT DEVON CORNWALL TWICE WEEKLY

GIVE US A RING OR CALL IN

2A BARTON HILL ROAD, TORQUAY, DEVON

TEL: 0803 312222 FAX: 326767



BESCO LTD EX-RENTAL TV's & VIDEOS

Huge selections. Complete range. All makes and models available.

★ New Stocks Every Day ★
VHS Video from £30
Television from £3

PICK YOUR OWN VHS VIDEOS Lots of 10 £20.00 each (mostly complete) Working Ex-Equipment Panels

★ IF THE PANEL YOU REQUIRE IS NOT LISTED PLEASE ASK ★

IF.	Converger	Decoder	Line Scan	Power	Frame
T20//22X	5	14	18	17	14
T26 X	5	16	20	17	X
Philips G11 14	.505	12	20	20	11.50
All prices include Postage & Packing, But + VAT					

BRADFORD

Springmill St Manchester Rd, BD5 7RL Ring Tony (0274) 308186

MANCHESTE

Unit 3, Mersey Rd. North Ind Est., Failsworth Ring David (061) 683 4612

Visa/Access welcome Prices are Plus VAT & Based on Quantity OPEN 6 DAYS 9-5

COLOUR TRADE

ESTABLISHED 1973 – WHOLESALE ONLY

NEW 'B' GRADE



LATEST NICAM FASTEXT F.S.T. MAJOR BRANDS

V - VIDEO - HIFI

SATELLITE

COMPLETE BOXED – WITH STAND – HANDSET – BOOK – ETC – MINT

Phone 021-359 7020

221-222 BRIDGE ST WEST, HOCKLEY, BIRMINGHAM B19 2HU

West Midlands T.V. & Video Wholesale

Have now moved to their new warehouse SPECIAL OPENING OFFERS NOW on full range of ex-rental TVs and Videos, working and un-tested



JUST ARRIVED NEW B-GRADE SAMSUNG
LONG PLAY VIDEOS ONLY £129
20" TELETEXT TVs £139 14" RC PORTABLES £95
MICROWAVE OVENS FROM £55
AND FULL RANGE OF MIDI HI-FI RADIO CASSETTE CDs IN STOCK
ALL TESTED AND BOXED
GOOD AS NEW WITH INSTRUCTION BOOKS

½ mile of Junction 10 M6. Easy Parking facilities.

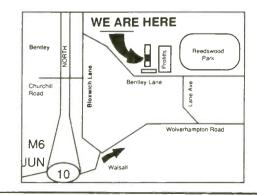
UNIT 3, BENTLEY LANE INDUSTRIAL PARK

BENTLEY LANE
WALSALL WS2 8TL

Tel: 0922 724542 Fax: 0922 722208

OPEN: Monday to Friday, 9-6pm

Saturday, 9-2pm. Sunday by appointment



NATIONAL TV DISTRIBUTORS

TEL: 021-505 2619

19 LOWER HIGH STREET, WEDNESBURY, WS10 7JX

SELECTED RANGE OF STOCK AT UNBEATABLE PRICES





TX9-10 £25 CHEAP COLOUR £15

3V35 £80

PRICE IS RIGHT COME DOWN NOW!

TX TEXT

AL SUBJECTED AND SECULATION OF SUBJECT OF SU

Only 10 Minutes Away from M5 Junction 1

SEMPLE



SERVICE

THE ONLY APPROVED THORN TELEPRICE DISTRIBUTOR FOR E. ENGLAND

SIMPLY THE BEST

BEST PRICES

BEST QUALITY

IN EX-RENTAL TV & VIDEO EQUIPMENT

RING LUKE ON Tel: 0945 476319

FOR YOUR BEST DEAL YET!

SEMPLE SERVICE

15 REGAL ROAD WEASENHAM LANE WISBECH PE30 2RQ



VISIONS • LONDON

Suppliers of THORN ex-rental TVs and Videos Working or Off-the-pile Unit 4, Rainstar Ind. Estate, Eley Estate, Nobel Rd, Edmonton N18 OAA (just off the A406)

Phone Now!! 081-807 7476/7579

OPEN 9 – 5.30 MON to FRI 9 – 1 SATURDAY EXPORT ENQUIRIES: Fax 081-345 6597

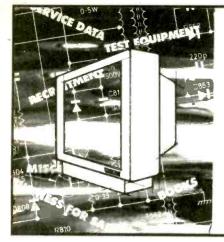


KÜNÍG

Main Distributor in London

OPEN SUNDAYS BY APPOINTMENT ONLY

APPROVED THORN TELEPRICE DISTRIBUTOR



TELEVISION CLASSIFIED

No other consumer magazine in the country can reach so effectively those readers who are wholly engaged in the television and affiliated electronic industries. They have a need to know of your products and services.

The prepaid rate for semi display setting is £10.35 per single column centimetre (minimum 3 cm). Classified advertisements 70p per word (minimum £12), box number £4.00 extra. All prices plus 17½% VAT. All cheques, postal orders etc., to be made payable to Reed Business Publishing Group. Advertisements, together with remittance, should be sent to the Television Classified Room L327, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS.



PHONE 081-661 8339 FAX 081-661 8931



LINEAGE

AVO MULTIMETER MODEL 8, £45.00. 500 volt megers £30.00. Prices plus VAT and p&p. Send SAE for lists of Surplus Instruments & Scopes etc. A.C. Electronics, 17 Apleton Grove, Leeds LS9 9EN. Tel: 0532.496(148.

TELEQUIPMENT COMPONENT TESTER, Marconi 'Q' meter, modern oscillograph, frequency standard potenometric recorder, working. No instructions. Offers and details. Tel: 051 523 3174.

TV/VIDEO SERVICE SALES SHOP. Living accommodation. Stock. S. London/Surrey borders. Selling lease £5,000 ono. Tel: 081 640 3155. Rent £40 wk.

SKY VIDEOCRYPT DECODER SERVICE SHEETS with colour decoding tracks, £15. Amstrad Satellite tuneable audio, £18. E.M.O. Ramsbottom, Lancashire BL0 9AG. Tel: 0706 823036.

VIDEO TECHNICIAN WANTED. Good pay rates. Apply Jomill Enterprises, 173 Dalston Lane, E8. Tel: 081-533 2229.

C.R.T. for oscilloscopes, monitors etc. Regret no domestic TV types. Possibly biggest stock of scope type in England! Big stocks of DG7-5/6/32, M31-184W. Billington Export, Unit F2 Oakendene Industrial Estate, Near Horsham, West Sussex RH13 8AZ. Callers strictly by appointment only. Phone 0403 865105, Fax 0403 866106, Telex 923492 TRA G.

PRIVATE RETAILER has excellent part exchange colour televisions and videos to clear. Tel: 0494 814317.

BUSINESS FOR SALE, well established reputation, TV/video, audio sales and repairs. Freehold shop and living accommodation, £67,500. SAV. Tel. 0270 214284.

EVERY ISSUE OF TELEVISION Magazine from January 1982 to December 1991 £150 plus postage. (0225) 790057.

6 COLOUR PORTABLES, inc. Teletext. 5 VHS Video, inc NVG12. 10 CTV's. £200 lot, no offers. 0298 71689

WANTED: KT66, KT88, PX4, PX25 transistors etc. If possible send a written list. Prompt reply and payment. Billington Export, Unit F2 Oakendene Ind Est, Near Horsham, West Sussex RH13 8AZ. Callers strictly by appointment only. Phone 0403 865105, Fax 0403 856106, Telex 923492 TRA G.

BUSINESS FOR SALE. TV, video sales and repair. Very profitable, long lease. S/E London. Rent £7,000 acc available. Price £25,950. Part finance/ownership a possibility. Tel: 071-274 8669 (mornings). No timewasters please.

WANTED REGULAR SUPPLIES of large & small quantities television & VHS videos, best prices paid. Tel. (0934) 641742 (daytime), 516483 (evening).

EX EQUIPMENT Television and Video spares available. Panels, Lopt, Tuners. Handsets etc. JH Services Tel 0243-820311

VALVES, HUGE STOCKS, credit cards accepted. Full 45 page valve catalogue now available £2.00 post paid. VNC. 20a Cossham Street, Mangotsfield, Bristol BS17 3EN. Telephone: 0272 565472 (24 hours). Fax: 0272 575442 (24 hours).

OCHRE MILL TECHNICAL SERVICES. Grundig TV spares for most models to 1985, fast, friendly, helpful, sensible prices. Gr Lype Farm, Charlton, Nr. Malmesbury, Wilts SN16 9DR. Tel. 0666 823228.

HAMEG OSCILLOSCOPE HM203-7 20 MHz dual trace. Brand new in box, unused. Complete with probes, manual etc. Still under guarantee. Bargain £325 ono. Tel. 0925 753157.

WANTED GOODMANS 20RC5160TT chassis, Sony 2705 L/T/B. For sale new Thorn 9000, 9600 psu. 0474 365782.

SMALLHOLDING FOR SALE, N. Wales, 10 miles Betws-y-Coed, fully modernised house, excellent potential TV servicing. Only £98K. Send for full details: Rick, 23 Russell Avenue, Colwyn Bay, Clwyd LL29 7TR. (0490) 82672, a.s.a.p.

CONTINENTAL NICAM DECODER boards, (Toshiba). Same chip set as Maplin. Some data. £18. Call 0752 405201 evenings.

WANTED

WANTED

Regular Supply of Ex-Rental Colour TVs and Videos.

Cash on Collection - Quick Service

Tel. 0742 312832

SPARES & COMPONENTS

ALLPARTS DISTRIBUTORS

SATELLITE SPARES

TV & VIDEO SPARES FOR THE TRADE AND PUBLIC BELT KITS, TRANSISTORS, ICS, REMOTES, FERGUSON, PANASONIC, SHARP, GRUNDIG, SONY, KONIG, PHILEX, AMSTRAD

ALLPARTS DISTRIBUTORS

101 ROCKY LANE, TUEBROOK, LIVERPOOL 6 4BB

051-260 4825

SURPLUS/REDUNDANT ELECTRONIC COMPONENTS WANTED

I/Cs – Tuners – Transistors – Valves – Diodes etc. any quantity considered – immediate payment.

ADM Electronic Supplies

Tel. 0827 873311.

Fax 0827 874835

TELEVISION CLASSIFIED LINEAGE advertisements can be submitted on this coupon of	with
a cheque made payable to Reed Business Publishing Group. Television Classified Room L327, Quadrant House, Quadrant, Sutton, Surrey SM2 5AS. The charge per word is 70p plus 17½% (minimum £12.00 + VAT.)	

	<u> </u>		
	2		
r Issue Dated	or next available. Total	insertionsTotal of Chec	ue £
	۸ ما ماسم		

Name	Address	***************************************		
	Post Code	Tel Num	Signature	
Debit my Access/ Visa Card (delete)	VISA			

Expiry Date

TELEVISION	MARCH	1992

.VAT Reg. No. 238 8937 10

MARCH MADNESS!

DON'T GET CAUGHT OUT BY RUNNING OUT OF POPULAR SPARES. BUY OUR KITS NOW! FANTASTIC SAVINGS!

KIT 1.

 $5 \times BU 208A$

1 × STK 5481

 $1 \times STK 5333$

1 × STR 50103A

 10×3.15 A.S. FUSES

1 × SHARP IDLER 0005

1 × SHARP IDLER 0006

1 × HITACHI IDLER UT11 ETC

5 × VIDEO LAMPS

KIT 1 PRICE - £30.00!

KIT 2. As above, but including the ever-popular 3HSS Head and 2 Back-up Batteries (1.2 Volt & 2.4 Volt)

Normal price — £57.50

Price when bought separately — £37.20

KIT 2 PRICE - £40.00!

P/P ON ABOVE KITS £2.00. ALL PLUS VAT.

WE ALSO STOCK A FULL RANGE OF TRANSISTORS, ICS, REMOTES, HEADS ETC. HUNDREDS OF USED BOARDS, DECKS, CABINET PARTS ETC. WHY BUY NEW? CATALOGUE OUT SOON! SEND BUSINESS CARD/LETTERHEAD FOR MAILING LIST. IMMEDIATE CREDIT TO BONA FIDE TRADERS.

STOCKS AND SPARES UNITS D1/D2, VICTORIA MILL ESTATE MANCHESTER ROAD, DROYLSDEN MANCHESTER M35 6EQ PHONE 061 370 7959 FAX 061 371 8398

P.S. ASK FOR TRADE COUNTER WHEN YOU RING 'COS IF THE BOSS FINDS OUT ABOUT THESE PRICES WE'RE SACKED!!

	_				
INTEGRAT				AMSTRA	D
PRICES INCLUDE VAT. Add £1.18 POSTAGE				PRICES INCLUDE VAT, POST AND PACKIN	G EXTRA.
				P.C.B's	
TV & VIDEO	.C.s	LA7033	3.29	4600 Video and Audio PCB	£17.63
AN262	1.12	LA7210	1.47	4600 Systems Control/Servo PCB,	L17.00
AN304	2.96	LA7505	2.06 1.23	Display and Control PCBs	£29.38
AN5015K	2.94	LA7910			125.30
AN5612	1.81 3.11	LU11417A LU52511A	4.23 4.23	4600 MkII Video and	£40.82
AN5620X AN6306	6.46	LVA508	1.65	Audio/Timer/Control PCB Assy.	140.02
AN6320N	2.47		3.29	4700 Video and Audio/	£40.82
AN6326N	2.88	LM1889N		Timer/Control PCB Assy.	140.02
AN6328	2.88	M51393AP	2.94	VCR100 Video and Audio/Timer/	£40.82
AN6346N	3.08	MC1408P8 MN15823FV0		Control PCB Assy.	1,40.02
AN6347	2.47	OEC0001B	5.23	5200 Timer and Channel Display	047.00
AN6350	5.02 2.14	OEC0001B	5.23	PCB Assy.	£17.63
AN6360 AN6362	3.47	OEC2001	3.35	5200 Audio Tuner PCB	£15.28
AN6881	2.70	SONY CX134	A 4.99	5200 Video PCB	£14.10
BA618	1.35	TD62105P	1.18	5200 Syscon. Servo Power PCB	£23.50
BA6301	1.65	ULA1H035E2		4600 Mk II/4700 Power Supply	£4.70
BA7001	1.23	UPA53C	4.05	CTV1400 Main PCB	£29.38
BA7004	1.65	UPC1382C	.90	CTV2200 PCB No:3 (Part 270087)	£3.53
BA8500	11.69	0, 0,00, 0	3.70	CTV2200 PCB No:4 (Part 270088)	£4.70
HA17458PS			5.29	TVR1 Control Panel/Preset PCB	£7.05
LA7031		14DN157	5.29	TVR2 Main TV PCB	£37.60
LA7032	2.42	14DN244C	5.70	TVR3 Main TV PCB	£43.48
HANDSETS				MECHANISMS	
VCR4600/4600	MkII		£11.75	4600 Video Cassette complete	
VCR4700			£17.63	mechanism (no drum or video	
VCR5200			£11.75	heads)	£29.38
VCR6100 Barc			£29.38	4600 Video Cassette complete	
TS90/99 Towe			£11.75 £11.75	mechanism (with drum no video	
VCR9000 Hand	set		111.70	heads)	£35.25
L.O.P.T. CTV1000	FB182K		£11.75	9000 Cassette Housing Assy.	£15.28
CTV1400	FB165KA		£11.75	MOTORS	
C1V200	FB171	`	£9.40	4000/4700 Capstan Motor	£11.75
CTV2000	FB171K		€9.40	7000 Loading Motor MCB2B01	£3.53
TVR2	1810951		£13.51	9000 Loading Motor MCB9B02	£3.53
TVR3	181297		£13.51	TUNERS	
PC12-HRCD/D		CT31	£14.10	5200 Varicap Tuner Type 1810829	£7.05
CONVERTERS				7000 Tuner CNV87358C2	£7.05
4700 RF CON\			£5.88	CTV1400 Tuner CNV87509F2	£5.88
5200 RF CONV			£7.05	CTV2200 Tuner UF2-831F	£5.88
SATELLITE EQ				PARTS OFF PCB's AND MECHA	
DISHES, FEEDS, LNB'S ETC. AVAILABLE, PHONE FOR LIST.				PHONE FOR PRICING	
I AVAI	LABLE. PI	HUNE FUH LIST.			AD ANTEED

Harrison Electronics CENTURY WAY, MARCH, CAMBS PE15 8QW.

FAX: (0354) 51416. TEL: (0354) 51289

VISA

ALL ITEMS ARE BRAND NEW AND GUARANTEED

* * SAME DAY DESPATCH * *

Write or Phone for FULL catalogue.



NFOTECH



76 CHURCH ST, LARKHALL, LANARKS ML9 1HE
Tel. (0698) 884585 Mon-Fri 8.30 am-5.00pm
Tel. (0698) 883334 Outwith business hours
FAX available all day, Mon-Sat, either line
Large SAE for FREE catalogue of other publications

PRACTICAL GUIDE TO BUY, SELL, REPAIR & SERVICE USED VCRs



At last! Everything you need for handling VCRs
How to buy ex-rental lots or single recorders
More stock faults for the commonest ex-rental models
than elsewhere at many times the cost
Brilliant practical repair and service system.

Introductory price £6.99

PRACTICAL GUIDE TO BUY, SELL, REPAIR & SERVICE USED TVs

More real data than books at three times the price

Only £9.95

BOTH GUIDES for only £13.90

COMPREHENSIVE ELECTRONIC DATA REFERENCE MANUAL Still only £5.95

Thousands of models, CTV, VCR, Camera, CD, Satellites, Audio, etc. All known equivalents & identification shown with all types of available data for each at latest prices.

WIZARD DISTRIBUTORS MANCHESTER TV. VIDEO & SATELLITE SPARES

LOEWE, SCHNEIDER. FERGUSON, HITACHI

and many other always in stock-

Video Heads for over 500 models Service Manuals for over 200 models Handsets for over 200 models Spares for over 20 manufacturers

Plus huge range of IC's, Semiconductors and Service Aids, etc. etc.

WIZARD OFFER A GREAT DEAL

Counter open Monday-Friday 9am-4.45pm Mall Order-Access Visa TRADE ONLY

EMPRESS STREET WORKS, EMPRESS STREET, MANCHESTER M16 9EN. Tel: 061-872 5438; 061-848 0060.

VIDEOS TRADE:

ALL MAJOR BRANDS PRICES START FROM

£45 SERVICED

£25 NON SERVICED

USED SPARES NOW AVAILABLE VHF/UHF CONVERTERS IN STOCK

WE ARE EXPORT SUPPLIER

JOMILL ENTERPRISES
173 Dalston Lane, Hackney E8
TEL/FAX 081-533 2229

For further details on classified please contact **PAT BUNCE** on 081-661 8339

RECRUITMENT

VIDEO & TELEVISION ENGINEERS

2 First Class Bench/Field Engineers required to service industrial and domestic AV equipment. First class salary and working conditions. Applicants must be experienced, energetic and fit. Be of smart appearance, have a good manner with people and be prepared to help develop and promote our service image. Excellent prospects for the right people. References will be required. Apply to I Williams

Audio Visual Maintenance Ltd. 28 Windmill Road, Hampton Hill, Middlesex. Telephone: 081-979 9573

to 24 volts up to ¹/2 amp. 1 to 20 volts up to 1 amp. 1 to 16 volts up to mps D C. Fully stabilised. Twin panel meters for instant voltage irrent reading. Overload protection. ully vanable, Operates £45 Inc. Post & Ins. £4 ter lates . NEW MODEL. Up to 38 volts DC at 6 amp. 10 amps peak. Fully variable Twin panel meters. Size 141/2"×11"×41/2". £96inc VAT. Carr £6. RADIO COMPONENT SPECIALISTS

TUBES

NEW CENTURY ELECTRONICS LTD.

UNIT 3, SWAN WHARF, WATERLOO ROAD, UXBRIDGE, MIDDLESEX UB8 2RA.



MANUFACTURERS OF HIGH PRECISION, HIGH RESOLUTION PHOTOQUALITY CATHODE RAY TUBES Applications:

- Scanning Electron Microscopes
- Medical Imaging
- Telecine
- Camera Viewfinders etc Remanufacture Service also available

Why not telephone Dave Dyson on (0895) 255800 to discuss your requirements? Fax No.: 0895 255619



INFOTECH

VISA

76 CHURCH ST, LARKHALL, LANARKS ML9 1HE Tel. (0698) 884585 Mon-Fri 8.30 am-5.00pm Tel. (0698) 883334 Outwith business hours

FAX available all day, Mon-Sat, either line Large SAE for FREE catalogue of other publications

VIDEO RECORDERS Save a fortune buying data

CIRCUIT COLLECTIONS

All JVC/Ferguson/Baird as 3V00-3V01-3V16-3V22-3V23-3V29-3V30-3V31-3V35-3V36-3V38-3V39-3V43-3V44-3V45-3V48-3V53-3V58-3V59-3V64-3V65-FV11-FV12 plus all the main models from AMSTRAD FIDELITY GRUNDIG HINARI HITACHI PANASONIC PHILIPS PYE SANYO SHARP SONY TOSHIBA plus all clones, modifications and other brands in 7 huge binders.

FAULT GUIDES

35 guides covering the stock and standard faults for every model included in the above collection.

COMPLETE SYSTEM

Enough data to set anyone up in the business of servicing and repairing VCRs. Includes all the above circuits, layouts and repair guides plus over £350 worth of Service Manuals plus many other VCR publications.

VIDEO CASSETTE RECORDERS A SERVICING GUIDE

3rd Ed. by S. Beeching Price £30.00 FREE WITH CIRCUITS COLLECTION

SONY TUBES REPROCESSED WITH ORIGINAL SONY GUNS

HIGH TEMPERATURE RE-PROCESSING of Sony, Mullard 45AX. 30AX, In-line, PiL, Mini (22.5mm) Neck and FST Tubes.

, and (==ionin) rook and i or rubes.				
370KRB22 £48.00 370LHB22 £48.00 400FFB22 \$58.00 510YXB22 £58.00 520SB22 £64.00 560E6B22 £54.00 560DYB22 £54.00 570HB22 £64.00 680DB22 £85.00 680DB22 £85.00	A51-231X £46.00 A51-570X £46.00 A51-580X £46.00 A51-590X £46.00 A56-540X £48.00 A56-701X £48.00 A66-540X £56.00 A67-701X £56.00 A67-701X £56.00 A67-701X £56.00 A67-701X £56.00	A51EAL00X		
For tube types not listed	All prices quoted are	Callers welcome		

please enquire

excluding VAT.

Exchange CRT is required.

Callers welcome. Please phone first. Nationwide Delivery Available

Tel. 0703 449783

WEST ONE

WELL VIEW, 114/134 Midland Road, Luton, Beds. LU2 0BL

WELL VIEW, 0 Southampton, Hants.

THRIFTY SPARES (WALES) Centrevision House, Sloper Road, Leckwith, Cardiff CF1 8AB

INCREASE YOUR PROFITS WITH USED SPARES

MANY MAKES OF USED VIDEO AND TV PANELS -GUARANTEED WORKING HUNDREDS NOT LISTED -PHONE OUR HOTLINE

0222 344218

£10.00 £8.00 £15.50 £5.50 £23.00 £11.50 £11.50

DON'T DELAY PHONE 0222 344218 TODAY

24 HOUR ANSWER PHONE

CLASSIFIED CLASSIFIED CLASSIFIED CLASSIFIED CLASSIFIED

FOR SALE



MICRO-LAB

Save TIME and MONEY by speeding up fault diagnosis.

Our MICRO-LAB instruments will help you find faults faster. The improvements can be dramatic. We know! We use them! Write or phone for a free brochure.

COLEBOURN ELECTRONICS Telephone

Dept TV, 20 Folly Lane, AL3 5JT 0727 44785 St Albans,

BUSINESS FOR SALE

TV VIDEO AUDIO SALES/REPAIR Large double shop, main road position. LOW RENT - LONG LEASE TAKINGS £125,000 PA AND RISING VERY PROFITABLE BUSINESS

£55,000 inclusive Tel: Brighton 0273 623254

BASIC ELECTRONICS

Do you have an interest in electronics, either as a future career or to pursue as a leisure activity? Do you have trouble locating faults in equipment, or safely adapting circuits to meet your specific needs? If so, and want to do something about it, send for details of

Direct Personal Learning course 11 Claydon Green K. Sparrow etc. Whitchurch BRISTOL Avon BS14 0NG Telephone: (0275) 835669

REPAIRS

LOEWE OPTA TV REPAIRS

FAST EFFICIENT SERVICE

Factory Trained Engineers Competitive Rates

MARWETECH,

Unit A7B, Aladdin Workspace, 426 Longdrive, Greenford, Middlesex UB6 8UH.

Tel: 081-575 0434 Fax: 081-575 0468

MANUALS

2. WHY BUY A MANUAL YOU MAY NEVER USE AGAIN?

JOIN "THE LIBRARY!"

A one off annual fee of £40.00 + VAT gives you access to our vast library of manuals covering the full range of brown and white goods. Up to twomanuals at any one time for up two weeks. Have as many as you like during the year!! The best idea to hit the servicing trade in years!

> Don't be the one that turns work away be the one that counts the money!!
>
> LOTS OF SPARES AVAILABLE — SEE OUR OTHER AD!

STOCKS AND SPARES

Electronic Component Distributors, Unit 2, Victoria Mill Estate, Manchester Road, Drovisden, Manchester M35 6EQ. TEL: 061-370 7959 FAX: 061-371 8398

VISA **ACCESS** MAIL ORDER

SERVICE DATA

A GUIDE TO SERVICING DOMESTIC VIDEO CASSETTE RECORDERS

A fully comprehensive series consisting of 7 separate videos, with additional illustrated teaching booklets.

This set of teaching programmes is a must to anyone concerned with the understanding and repair of video cassette machines.

> Programmes also available separately.

Microforge Limited, 339 Clifton Drive South St. Annes, Lancashire FY8 1LP Tel: 0253 725499

Please send me further information on
'SERVICING DOMESTIC VIDEO CASSETTE RECORDERS'
Name
Address
Post Code

Please note new telephone number from 25th February 1992

081-652 8339

Commercial & Trade Technical suppliers for over 20 years Technical Information Services



76 CHURCH STREET, LARKHALL, LANARKSHIRE, ML9 1HE Tel.(0698) 884585 Mon-Fri 8.30am - 5.00pm or (0698) 883334 Outwith business hours BARCLAYCARD VISA

FAX facility available all day on both lines

Write now with an SAE for your FREE QUOTE, FREE CATALOGUE & FREE NEWSLETTERS ALL TRADE ADDRESSES GIVEN !FREE! JUST PHONE TO FIND THE NUMBER/ADDRESS YOU NEED

Some Selected titles (Taken from over 150)

Practical TV Repairs 2nd Ed. £16.95 £16.95 CTV Servicing by G.King The PAL System £8.50 TV & Video Technology £12.95 TV & Video Engineers P/Book £12.95

Practical Radio Serv'& Repair £12.95

S.Beeching's VCR Servicing £25.00 Servicing Mono TV's VHS Common Faults Microwave Servicing Hi-Fi Servicing Guide Servicing Audio & Hi-Fi

Refrigeration Pocket Book Spectrum Repair Guide Spectrum Complete (+,128k,etc) Europ'n Scrambling Sys's *New Sections Data Reference Manual Principles of Compact Disc

£14.95 £5.00 £35.00 £29.00 £5.95 £3.50



Remember, not only do we have EVERY service sheet ever produced, but we also have THE WORLDS LARGEST COLLECTION OF

& WE ARE SOLE SUPPLIERS OF VARIOUS FAULT-FINDING GUIDES, REPAIR MANUALS & TECHNICAL MANUALS

£17.95

£3.50

£9.95

£9.95

£25.00

INTEGRATED SYSTEMS from TIS

£265.00 10 Giant binders of CTV Circuits, Schematics, PCB's, Waveforms, etc. 6 Giant binders of VCR Circuits, Schematics, PCB's, Waveforms, etc. £190.00 All 6 VCR binders PLUS 30 Fault-Finding Guides for ALL models covered £230.00 The 10 CTV Binders PLUS over 20 CTV Repair Guides & lots, lots more £399.00 £599.00 All the CTV & Repair Guides PLUS VCR binders PLUS fault finding, etc. TVAR complete, Two books & two binders of Giant diagrams (upto A2) £89.45

SERVICE

Available for most equipment. TV. Video, Audio, Test, Amateur Radio, Military Surplus, Kitchen, Vintage Valve, Computers etc.

Over 100,000 manuals available for equipment from 1920's to the present. Originals or photostats supplied as available.

FREE Repair and Data Guide Catalogue with all orders or send SAE for your copy today.



MAURITRON(TV) VSA



8 Cherry Tree Road, Chinnor, Oxfordshire, OX9 4QY.

Tel: (0844) 51694 Fax: (0844) 52554

TEST EQUIPMENT

P & E SERVICES

SUPPLIERS OF ALL MUTER REPAIR AND TEST EQUIPMENT.

BMR 95 TUBE REGENERATOR **BMR 700** TUBE REGENERATOR CBE DEGAUSSER

VARIABLE ISOLATING TRANSFORMER CSG 4 AT 2 PATTERN GENERATOR AUDIO SERVICING UNIT

10N 2

ASK FOR FREE BROCHURE

34 GLAN-Y-MOR ROAD, PENRHYN BAY. LLANDUDNO, GWYNEDD LL30 3PF.

TEL: 0492 549246 FAX: 0492 547880

RECENT **READER** RESEARCH indicates that 91% of readers responded to advertisements in Television last year.

AT 2, Audi-Multi-Te-16 test-circuits for loudspeakers, tuners, amplifiers, head phones, tape recorders, mikes, boosters,



car radios, CD-players; measurment of millivolt, drift, watt, performance; with generator, radio, signal tracer/injector, 13 volt supply etc.



BMR 95 **BMR** 700



Regenerating Computers & Measurers for CRT's with cathode protection, gas clean-up aid, short repair; exhausted CRT's becomes bright and sharp again even it all other machines do not succeed.

United Kingdom: P & E Services, Llandudno, Tel. (0492) 549246, Fax 547880.

Ireland: Dönberg Electronics, Ranafast, Co.

Donegal, Tel./Fax (0.75) 4.82.75. **New Zealand: TDON Ltd.,** Onehunga, Auckland, Tel. 6.68-9.07, Fax 6.68-4.99.

Germany: Ulrich Müter, Oer-Erkenschwick. Fax (0 23 68) 5 70 17.

FOR MORE CHOICE + VALUE + KNOW-HOW SEE PREVIOUS ADVERTISEMENT FOR COMPREHENSIVE PRICE LIST

J.W. HARDY 8-WAY **AMPLIFIER**



High quality – top value. Frequency: 470-860 MHz Gain: 2dB per outlet Power: 240v AC 4.8 Watts Rugged, screened case, £18.95

TWIN OUTPUT LNB

— 2 receivers from 1 dish! Revolutionary Twin Dutput LNB allows you to watch different programmes all over the house. Wi serve up to 2 receivers. £59,00 The system can be extended up to 32 receivers from the 1 dish, in multiples of four. 4-Way Switching Box. £29.95

AMSTRAD SRD 400

48 channel receiver New 1.2dB LNB Black 60cm mesh dish. £146.00

New For 1992 * AMSTRAD 600 RECEIVER

Videocrypt Decoder D2 Mac Decoder Eurocrypt Decoder P.O.A.

VIDEO SENDER RF 280

For ultra-clear satellite or video pictures i any room. No need for cables, Just plug in to sat receiver or video. £19.95 Non-certificated for UK

PRESENTING PACE 9200 IRD

90 channels, Wegener stereo, on-screen graphics, enhanced frequency scan mode. Access to all receiver features. NOW WITH NEW 1.2dB LNB. £195.00

SKY DECODERS



NEW - £65.00 with 12 months' warranty SECONDHAND - £45.00 with 6 months' warranty

PALCOM RECEIVERS

NEW - X10 POWERMID

Uses your existing remote controls to control your TV, VCR, stereo, CD, Satellito or Cable Converter from anywhere in your house. Just plug in – no wires £39.95 D.T.I. Approved

STOP "SPARKLIES" WITH NEW 1.2dB LNB

"The Satellite Book" by John Breeds A complete guide to practice. £27.95

WE SUPPLY EVERYTHING IN ACCESSORIES

Trade Distributors for Pace, Palcom, Promax, Amstrad, Volex, Raydex, Wolsey, Labgear, Telesti, Triax, Lenson Heath, Continental Microwave TRADE ONLY TRADE ONLY

Minimum trade order £60.00 All prices quoted are plus carriage plu VAT

J.W. HARDY, 231 Station Rd, Stechford, Birmingham B33 8BB



TV & VIDEO TRADE REFERENCE MANUALS

UNIQUE REFERENCE DATA FOR THE TV AND VIDEO SERVICING TRADE.

TELEVISION CHASSIS GUIDE

Listing thousands of Models (Colour & Mono) and their Chassis Designations. Enables you to identify any chassis for any TV from the model number. Order Code MTP-18.

VIDEO RECORDER EQUIVALENTS

Lists all known models and their alternatives. Fully cross referenced for fast and easy use. Order Code MTP-143.

TRADE ADDRESSES

VISA

Hundreds listed including TV, Video, Test and Computers. Includes all the obscure and hard to find suppliers of the unusual brand names. Order Code MTP-23

THESE 3 BOOKS CONTAIN THE MOST COMPREHENSIVE REFERENCE DATA AVAILABLE ANYWHERE FOR THE TV AND VIDEO TRADE

> ONLY £5.00 EACH BOOK PLUS £2.00 POST/PACKING PER ORDER.

Phone your order with Access or Visa for immediate despatch.

Hundreds of other Repair and Data Guides available from our Catalogue available FREE upon receipt of a stamped envelope.

MAURITRON TECHNICAL SERVICES

8 CHERRY TREE ROAD **CHINNOR** OXFORDSHIRE



OX94QY Tel:- (0844) 51694. Fax:- (0844) 52554

Service manuals available - See our other advert elsewhere in the magazine

Sony Music Entertainment (UK) Limited

AUDIO/VIDEO ENGINEERS CIRCA £21,000

Sony Music Operations is a leading manufacturer and distributor of audio and video products throughout the U.K.

Due to the recent introduction of a state-of-the-art Video Plant, applications are invited from people with relevant experience in the audio and video engineering fields.

The job involves the setting and routine maintenance of high speed audio and video duplicating equipment to the highest quality standards and some project work will also be involved. Ideally, you will be qualified to a minimum of HNC level, or equivalent, and possess a good electronics background with fault finding to component level.

For the above staff positions, we are offering an excellent salary. In addition, you can expect to receive a range of Company benefits, including 25 days annual holiday, subsidised restaurant and generous discount on Company product.

The Company is currently considering a number of options to ensure 7 days, 24 hours cover.

To apply, please telephone Linda Russell on (0296) 26151 for an application form. Alternatively, write to her enclosing full details to:

The Personnel Department, SONY MUSIC OPERATIONS,

Robans Lane, Aylesbury HP19 3BX.

MAURITRON TECHNICAL PUBLICATIONS

The following is a selection from our vast range of Technical Manuals for the TV and Video Servicing Trade. Order some today.

Order Code Title	Price
MTP-5 Video Recorder Faults – Repair Guide	£1.95
MTP-58 VHS Video Recorder Principles	£1.95
MTP-7 Transistor Radio Repair Guide	£1.00
MTP-9 TTL Integrated Circuits Databook	£4.95
MTP-10 CMOS Integrated Circuits Databook	£4.50
VHCK Video Head Cleaning Kit	£3.50
MTP-9 Power Supplies & Voltage Regulators	£2.95
MTP-24 Transistor Equivalents and Testing Manual	£4.50
MTP-8 Record Player Speed Disc	£0.95
MTP-19 Telephone STD Code Location Guide	£3.95
CRECIAL OFFER. Order the full set of the above for only for	

SPECIAL OFFER: Order the full set of the above for only £25.00, a saving of £5.20 over the individual price of £30.20. Use Order code MTP-189.

Phone your order today using Access or Visa for immediate despatch.

All orders plus £2.35 post and packing.

Hundreds of other Repair and Data Guides available from our Catalogue available FREE upon receipt of a stamped envelope and sent with all orders.

MAURITRON PUBLICATIONS (TV3)

8 Cherry Tree Road, Chinnor, Oxfordshire OX9 40Y



Tel: (0844) 51694 Fax: (0844) 52554

Service Manuals available: See our other advert for details

NEW PRODUCT!!

How many wasted hours have you spent on servicing?

E.C.S. offers you complete index of approx. 5,000 TV and video faults listed in 10 years of TV mag.

Index's are alphabetically listed by make, model, fault and are now available for just:

£7.50 for Television Faults
£7.50 for Video Faults
or £15.00 for both sets complete with protective ring binder. Regular updates are also available. But one of the above index's must be purchased in order to qualify for this service. To secure your order please make Cheques/Postal Orders payable to:

E.C.S. 31 Prenton Road West, Prenton, Birkenhead, Merseyside L42 9PY.

Please add £1.50 per order for P&P

STANDARDS CONVERSION

Tapes converted to UK standard (PAL) at reasonable rates. Secam conversions and tape copying also available. We now also convert Sony 8mm from NTSC to PAL or visa versa. Private and company work welcomed.

Send material with requirements or phone/Fax 0444 400 091, 9am-9pm AVIATION VIDEO (Gatwick), Alexander High Street, Handcross, W. Sussex RH17 6BS.



SATELLITE TV RECEPTION

DRAKE Receiver/Positioners from £299 Waveband Magnetic Polarisers from £29 60cm to 3m Antennas, polar mounts 11/12/4Ghz LNBs – feeds, accessories SAE for Leaflets

KESH ELECTRICS LTD

Main Street, Kesh, Co Fermanagh BT93 1TF Tel. 03656 31449 Fax. 39250 Tix 747412

TRAINING:

DAY **COURSES**

Nicam Digital Stereo March 20th Fee £50.00

Computerised TV Receivers April 6th Fee £65.00

For Details Contact Sharron Watkins,

NORTH WEST LONDON TRAINING CONSULTANCY Denzil Road, London **NW102XD**

GERMAN SERVICE SHEET **SPECIALISTS**

Our connections are world-wide. We furnish any kind of German, European and Japanese service sheet or manual. Thousands of different sheets and manuals in stock. For any enquiries:

DÖNBERG ELECTRONICS

Schoolmasters House, Rannafast, Co. Donegal, Republic of Ireland. Phone: 075 48275

TEXSCAN CATY DECODER

Tuner FX range 54MHz-450MHz. Features: full 60 channel capability. High performance. 611 MHz IF. Built-in prescalar. Uses advanced ECL. Integrated circuits and dual gate MOSFETS. Output on channel 48 UHF-PAL synthesiser controlled. Brand new, boxed, with circuits and information. Not tested.

> **TELFORD ELECTRONICS** Tel: 0952 605451. Fax: 0952 677978

ARE YOU HAVING TROUBLE GETTING **HOLD OF YOUR REGULAR COPY OF TELEVISION?** IF SO, WHAT **ABOUT TAKING OUT A SUBSCRIPTION?** FOR MORE DETAILS, PLEASE RING OUR **SUBSCRIPTIONS** DEPT. ON: 0444 441212

Ext. 5320

INDEX TO ADVERTISERS

Aerial Techniques 343 Antex Electronics Ltd 365	Hockley Discount Televisions Hussain Central TV Ltd	366
ASJ Electrotechnik 366		
Audio Electronics	ICS-Intertext Group Ltd	365
Audio Vision (UK) Ltd	JJ Components	357
AWI Ltd		
A-Z Electric	KSA Wholesale Components	370
Posts 151 to 1	Manor Supplies	331
Beechwood Electronics	Marapet	
Bi-Tel		
BK Electronics 325	NGT Electronics	368
Broughfame Ltd	Philex plc	IBC
Bull Electrical	PV Tubes	324
Campion Wholesale Ltd	Reed Exhibitions	221
Central TV Wholesale Distribution Ltd 376		
Centrevision	Satellite Solutions (UK) Ltd	327
Chromavision	Semple Service	380
Coastal Aerial Supplies 371	Sendz Components	OBC
Colourtrade of Birmingham 379	Southern TV	364
CPC Ltd	Stewart of Reading	326
Crewe Wholesale TV Ltd	Supervision	378
Cricklewood Electronics Ltd 364	Supreme Satellite	326
SHOWOOD ELECTION OF ELECTION O	Swift TV Publications	366
Devon TV & Video	Swiftpark Components	368
John II a Made	Teleprice Ltd	377
East London Components	Thunderbird Electron Management	345
Economic Devices 350-351	Tidman Mail Order Ltd	365
EEC Satellite Services 320	Tristar Manufacturing	328
Floatronias World		
Furae International Ltd	Visions (GB) Ltd	380
Express TV Supplies 326	Vista Electronics	364
J20	W T Shipping	371
GGL Components 322	West Midlands TV & Video Wholesale	270
Grandata Ltd. 314-318	Willow Vale Electronics	210
Guild of Master Craftsmen 365	Wiltsgrove Ltd	272
300	**************************************	113

TX90 REMOTE PANEL LNB's WITH FEED HOR 12.75GHz 1.5 db s	N AND POL n. £35. SE	ARIZER 10GHz ND FOR DATA.	TO	SATELLITE 19 C.H. with 32 C.H. P	ı Hand S	Set £40	ISO REPL	N FRAME IC K100 etc IDA 3652 BSOLETE ACEMENT 3654 £2.00
NUST SPRAY AND IT IS CLEAN. PHILIPS' NEW VIDEO HEAD SPRAY CLEANER: £2.10 OR 10 FOR £1.50 EACH SMALL SATELLITE TUNERS (950 to 1750 MHz), LF. free	DISH £35	Postage £5.00 with LCi display	Philips Video andset AV5661 AV5659	PB500 Panic and Button Transmitter 180MHz G11 CAP 250V, 470M	£1.00 FI	SATELLI NDER KIT LNB TEST	T AND M.	TOSHIBA AGNETRON 2M172 AH £20
STATELLS STEAD TUNES VIFFUHE S, BAND TUNES NEW PLASTIC CASE 32 C. H. SAT-RECEIVER (no hand s NEW METAL CASE SAT-RECEIVER, 32 C. H. WITH DO DAM MAINS CHASSIS AMSTRAD MONITOR C. UNIVERSAL TRIPLER, NEW TYPE VIDEO LEADS. AMSTRAD Line O. P. Transistors with Diode 2SD/453 BU208A. VIDEO LAMPS. Long Lead HITACHI & GEC FRAME, Thick Film. FIDELITY SPLIT DIODE	el) LBY & CHANNEL C	£3.00 £35 (Post £5) (no hand set) £35 (Post £5) £10 £4.0080p £1.00	CAMCORDER SANYO NP22 6v 1300mah Rechargeable Battery Pack £6.00	NEW PROFESSIONAL SATI RECEIVER WITH HAND METAL CASE WITH ME DOLBY CHANNEL C W POLARIZER SUPPL' £50 SEND FOR DATA AND P	ELLITE SET, TER, TTH	WITH ME NO BOX: 6 TUCH (Replacem Draw Un £10	E25 G11 ent	PHILIPS STEREO IEADPHONE £4.00 PHILIPS C.D. ECH. 691-30212 £19.00
KSO FRONT PANEL 1E1-TEX TYPE NEW GIT LINE OP PANEL PHILIPS YEARS AHEAD THE CREDIT CARD CALCULATOR Solar Powered . NEW PHILIPS SBC 1833 Solar & Battlery Powered Calculation of the control of the con	\$ tor. \$ £ sas Trans \$ £ sins Trans \$ £ \$ £ \$ \$ £ \$ \$ £ \$ \$ £ \$ \$ \$ \$ \$ \$	3.75 8.00 1.00 1.00 1.00 1.00 1.00 1.00 1.15 1.15	RICAL ETER £3 eads £50 LTER £12 sockets on ion Box g and box lead	Gas Soldering Irons Variety Nickel Cadmium I Sub-C.50p per cell. AdTO DC and AC and Resistanc G11 8 Touch Button with I Philips New Hand Set Dig Text Sets after G11	y in packs of 6 to PRANGE be Pocket 3000 P Lamps, Non-rer	Specific Spe	THORN	NEW, PANELS FIDELITY 3000 Main Chassis, non-Remote & Remote £15.00 and 4000 CHASSIS £15.00
KT3-K30-K4-K40 CTX ETC Mains Switch 75p- GH LOPTS 5		Stereo Headphones BC 3140 £4	1.00	Desk Calculator				ADPHONES £1.
PHBLIPS DESK TYPE Dual Power Calculator SBC1704	7.00 Stereo	Headphones .50 £1	.00 PHILIPS	UNIVERSAL BATTERY TESTI	_		THORN RECT PANEL TX100	
4.7μ KT3 W/W 10 for £	Directi	SBC3040 Mono Uni ional Condenser		X POWER SUPPLY Mark 1 and	2		STEREO K40 SOUND O.P. I	
KT3 Triplers	ES.00 Dynan	phone Philip nic £6	0.12.110	. K35 Decoder	12V DV min - 1	£ = 65.00	CC	OST £25
K3 Tex Front Panels with LCs (SAA 3027P/SAB3013/ HO448328) G8 100K Pots on Panel & Lead for 6 Push Button Unit	£5.00 10mm Ti RADIO 1	HICKNESS SOLAR POWER WITH EARPHONES	2.00 PTT Turn	arten PWR, SUP, 500M/A 1.5V- er & IF, Can HF-module 2 UK	12 A TAC SMHCUGG	£20.00	PHILIPS MET	TERS
K30 Mains Switch remote K35 Mains Switch remote	£1.00 TX9-1	TX100 FRONT PANEL. WITH REMOTE £10	£5 KT3-K30					0 MFD 250v E1.35
K35 Aerial Socket and Plug in Lead to Tuner KT3-K30 Slider Pots 4.7ku	£1.50 20p each	NON REMOTE 8 push button £10	TX100 P	ush Button Unit 16 CH £10.00	BLACK	MESH		ADAPTOR ed 3Amp
LARGE Foacs Pots Fits Pye. GEC. ITT. Decca L.C.D DISPLAY LANUGUAGE			75p WIRE PI	PE stud detector £4.00		SH EIVER	Long La	ad with plug TV etc
TRANSLATOR — ENGLISH, FRANCAIS.		PS NEW TYPE AND SET £10	MICRO	WAVE leak detector £4.00	AND	LNB		0 off, 15p Each
DEUTSCH, ESPANOL, ITALIANO — £15 GLASS BEADS Diodes 200v/1.2A		50 fo		PIPE detector £4.00			CASSETTE MAINS LEADS	30
G11 Decoder Panel 58.00 T	MIXED OSHIBA AND SETS	SECURITY FLASHI LIGHT WITH RED AMBER LENSES MAGNETIC FACILITY	&	DECODER C-CAM PHILIP MADE for K40 CHASSIS IC No. TDA 3590 \$8.00			TELEPHONE EXT. LEAD 3 Metre	
50% OFF ALL GI1 PANELS FIV	E FOR £12	£1.00 EACH		FIDELITY NON TEX	T HAND SE	r	All Pin Long	EART LEAD
Have you got Acid Rain in your garden? PH METER Video Power Supply for Amstrad, Last year mods. Mains Transformer for Amstrad Video LATEST VIDEO	£5,00 £1,50 £5p (£1 post)	1640 Colour Monit Chassis £6 + 1	or Post £3.	for 3000 chassis, £5.00 A 20A/600V THYRISTO			BRIDGES REM Mixed BR-31 (2 Amp to 5 Am	
Local Philips, GEC, Pye and Hitachi, Front panel with men 20AX GEC LOPT Panel with Split Diode RANK 120 Focus Pot RANK 718 Focus Pot	£4.01 75µ £1.01	TX100 FRO		LCD VIDEO AMSTR. for models 1990		T 1	TX90 MOD 37 The Sweep Tur TX9139/001	
167 LOPT Spitt Dode: 2433481 Ex Pariel Spitt Dodes: 2432871/2432981 Spitt Diode: 2433752 T703A LOPT Transformer Rank with Focus Pots and Diodes	£6.00 £5.01 £6.07 £2.00	8 Button	1 1	NEW MAIN P Damaged Video Panels For parts £3.0	. Amstrad Ta	ton	T6070V TX9 T TX9 90D4-106 TX9 90D4-009	-004 £1
MAINS TRANSFORMER 240v in/20v/8v GREEN FLAT, NEC, LED's 3p each	£1.00 100 for 12	100 Off 20p Each S.W. Filters 1 Off 50p Each	+	BACK-UP CAP			Chopper Trans	
15V015V 1 Amp Print Type 12+12V 2 8VA Print 1*x 1* 8+8V 1 Amp Print	£1.00 SW 75p SW 75p SW	153 SW 154 SW 514 SW 514 SW 153 SY	179 514 179	Olt. Cap. 0.047F 75p A M S T R A D 8600 VIDEO MAIN PANEL MODULATOR IF TUNER and ICs Damaged Panels £5.00 Model A1 to A33 SALORA & LUXOR 32 CH SATELLITE RECEIVERS No hand set £30.00 post £5		VIDEO SCART TO SCARI ALL PIN, LONG LEAD £3.00 ALL PINS TX90 TX925 TX100 Mains Switch with Stand-by and Lead 3 for £l or 50p e UNIVERSAL VIDEO-RECO This kit may also be used connect a mono to stereo. £l		
ETS% UHF V/CAP Tuner, small FIDELITY Panels with LC. FIDELITY LOPT Split Diode AT2076/80 AT 2076/280	£2.50 SW £5.00 SW £3.00 SW £5.00 SW SW	270 SL 303 SY 503 SY 203 SY 185A SY 505 SY	178 701 177 453 639 453					
TX10 8 way button unit THORN TX90 Remote chassis 14° Complete	£8.60 £12.00	146 SY 2 453 SY 2 174A TX90 TO TX100 8 BUTTON UNIT £4.00	260					
TXIIII Green Spot E15.00 MSH	186N243 £10	36362 36482 SPLIT).P.T. r-Diode ilips	TRANSFORMERS 3112-338-30942 £1.00 3112-338-30633 £1.00 31112-368-9050 £1.00 3112-138-98994 £1.00 3112-338-30634 £2.00	AT203600 AT203811 AT2055 AT207635 AT207631 CVC 820 CVC 800	AT2076/55 AT2076/7157 AT2088415 RCO ST CT3. OT2041 FB165KA Ori 2076/51 2432461 24334	SHARP MSHIFC £10 000 EAC 0004-235 002-01	FIT MOS SETS New Tho Hand Se Type u/v (£
K41.D.P.T. GEC 85.9793-6 TFB- K80 LO.P.T. CPM K00 2333452 2432864 E10 EACH	4023AD £10 Philips Split 2 £10.00		EACH	3122-138-53861 £1.00 3122-138-98094 £1.75	10 F	RECTIFIERS OR £1.00 ideo Power Suppl	AMP TUNER by & GEC	OR for VT568 type ER IF for VT568 Hitach ES 12" 90% MONO
ITT TUNER CAN CMR 800/3 £20.00 BURGLAR ALARM			20 MHz OSCILI 40 MHz OSCILI 60 MHz OSCILI	.0SCOPE (5020) 5200 .0SCOPE (5042) 5250 .0SCOPE (7060A) \$1000				BES £10
TTT PANEL 1C 301 CMC 113 CMC 302 1C 115 CMC 303 CMC 96/4 with siren	PHILI		1 AMP POWER SL	IPPLY WITH MAINS PLUG £4 TTCH. NO HANDLE WITH CORE	D. BLACK IN COL	OUR £5		Fit most sets ASTRAD VIDEO AND SET WITH LCD £10
video leads relays 35p	G11 TEXT U	PS HAND SET LTRASONIC £10 TRV3 Ametrad Case	G11 TEXT II HAND SET £	12.50 ULTRASONIC	£10 EASY C			MkII KIT MODU 10.00 with data
5V-12V-24V-48V		VR3 Power Sunniv CA	Amstrad Lalevie	KON TUNER DRIF. SMAII. FRE O				
5V-12V-24V-48V SEL TTT 1FB254F/2 Front Panel	SEN	JD7 PHILII	PS SBC 521 RF PS SBC 522 RG	SIGNAL GENERATOR £95 B1 GENERATOR £90 ALOG MULTIMETER £11.5	5	20.	Burglar Ala Has time de	arm elay to set

TAA7750	100	Y 729 Y 729 Y 730 Y 827: 6A/1KV Y 860 Y 933 Y 969 Y 997 Min 12 volt Relays R 1038 R 1039 R 20106 R 20106 R 2257 R 2210 R 2220 R 2210 R 22210 R 22210 R 2232 R 2330 R 23322 R 2336 R 23322 R 2396 R 232323 R 2396 R 2433=BD124 R 2433=BD124 R 2433=BD124 R 2433=BD124 R 2433=BD124 R 2433=BD124 R 2540 R 2433=BD124 R 2540 R 2520 R 2435 R 2430 R 2433=BD124 R 2540 R 2520 R 2520 R 2530 R 25	15p
LA11440	88	Y 860 Y 933 Y 969 Y 933 Y 969 Y 997 Min 12 volt Relays R 1038 R 1039 R 20106 £1 R 2029 £ 2210 £ 2257 £ 2210 £ 2257 £ 2265 R 2305 R 23223 R 2333 R 2333 R 2333 R 2333 R 2333 R 2336 F 2340 £ 2433=BD124 R 2030 £ 2433=BD124 R 2030 £ 2433=BD124 R 2030 £ 2433=BD124 R 2030 £ 2433=BD124 R 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 2540 £ 25540 £ 25540 £ 25540 £ 25540 £ 25540 £ 25540 £ 25540 £ 25540 £ 25540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 255540 £ 25554	MAB 8400B-6 £3.00 MAB 8440P-D070 £3.00 MAB 8444P-D1033 £3.00 MAB 8444P-D1036 £3.00 MAB 8444P-D1056 £3.00 MAB 8444P-D1056 £3.00 MAB 8441P-T132 £2.00 MAS 8441
LA 11440	### ### ### ### ### ### ### ### ### ##	Y 969 Y 997 Min 12 volt Relays R 1038 R 1039 R 20106 R 20106 R 2029 R 2210 R 2227 R 2265 R 2305 R 2305 R 2305 R 2303 R 2323 R 2396 R 2461 R 2030 R 2433=BD124 R 2433=BD124 R 2735=T1P41 R 2775=T1P416 R 3129=T1P47 T 6068V R 3129=T1P47 T 6068V R 4050	MAB 8440P_D(033
TAA7750	M24 £30p cp 40p 40p 40p 40p 40p 40p 40p 40p 40p 40	Min 12 volt Relays R 1039 R 1039 R 2019 R 20196 R 20106 R 2029 R 2210 R 2257 R 2265 R 2316 R 2333 R 23323 R 2396 R 2461 R 2030 R 2433=BD124 R 2540 R 2030 R 2433=BD124 R 2540 R 25540 R 25540 R 25540 R 25540 R 25540 R 25540 R 255540	MAB 844 P-T 32 £2.00
Int At 1148S	40p Apply for pectrum +2	R 1039 R 20106 R 20106 R 20106 R 20106 R 20106 R 2029 R 2210 R 2257 R 2265 R 2305 R 2305 R 2305 R 232233 R 2396 R 2436 R 2433=BD124 R 2030 R 2433=BD124 R 2735=T1P41 R 2775=T1P416 R 3129=T1P47 T 6068V R 4050 R 405	December 10
MS96S7P	Adop	R 20106 £1 R 2029 R 2210 6 R 2257 R 2257 R 2265 R 2305 R 2306 R 2322/2323 pair 8 R 2306 R 2322/2323 R 2396 R 2432 R 2433=BD124 R 2435=BD124 R 2540 R 2540 R 2540 R 2540 R 2540 R 25540 R 25540 R 25540 R 25540 R 255540 R 255	Description
Receiver TX100 Panel 1.00 Fidelity Tube Base with transitor & focus pot 1.00 Total Tube Base on panel 1.00 Total Tube Base Base Base Base Base Base Base Bas	Adop	R 2210 R 2257 R 2265 R 2305 R 2305 R 2306 R 2323 pair 8 R 23223 pair 8 R 23223 R 2396 S R 2401 R 2403 R 240	Syc 725 LOPTs
Process Proc	15p 10p	R 2265	Description
1.C. No. SAB3035	15p 10p	R 2306 R 23072323 pair 8 R 23223 R 2396 S R 2406 R 2403 R 2403 R 2403 R 2403 R 2403 R 2408 R 2508 R	Op. CMC 302 Panel with TC mains switch etc E5.00
-SAA 1060 -PCF857IP 100 L.O.P.T. Green Spot	15p 10p	R 2323 R 2396 R 2396 S 2461 R 2396 S 2466 R 2030 R 2433=BD124 S 2540 S 2540 S 2540 S 2738=T1P41 R 3738=T1P41 R 3129=T1P47 4 T 76068V S 4459 S 24086 S 251898B S 25188B S 2518B S 251	15p etc
New Model Philips Meter	R 10p R 30p R 30p R 10p	R 2461 R 2030 S 2030 S 2030 R 2433=BD124 R 2540 R 2540 R 2738=T1P41 R 27738=T1P41 R 3129=T1P47 T 61068V S 2008h R 2510898B S 2510898 S 2510898B S 1 S 250898B S 1 S 2008h S 3 S 250898B S 1 S 250898B S 25089B	CMD 8(0) Decoder E8.00
Section Sect	100 100 100 100 100 100 100 100 100 100	R 2433=BD124 R 2540 £2 R 2737 R 2738=T1P41 R 2738=T1P41 R 3129=T1P47 F 6168V S R 4050 £1 S 2008b B 251898B £1 25C1942 £1 Hitachi sets etc. STR 454 £25TR6020 Kit 66 S 2000AF inc α.p. £1 BU 10504 BU 108 £25	OT Hand Set £6.00
Types Fidelity front panels with i.c. September	100 100 100 100 100 100 100 100 100 100	R 2737 R 2738=T1P41 R 2775=T1P41c R 3129=T1P47 4 T 61068V 5 R 4050 £1. S 2008b 8 25D898B £1. 2SC1942 £1. Hitachi sets etc. STR454 £2 STR6020 Kit 66 S 2000AF line o.p. £1 BU 10504 £1 BU 108 £1	No. Acc. Power's Supply GT1 Full Remote Receiver Fanel \$3.00
4 Types Fidelity front panels with i.c. & pais B 103	500 10p 500 35p 500 25p 500 75p 530 10p 500 8a 10p 500 8a 10p 50 12p 50 10p 60	R 2775=TIP41c R 3129=TIP47 G 608V S R 4050 E1. S 2008b S E1. S 2008b E1. S 2008b E1. S 201842 E1. Whitachi sets cit. STR454 STR6020 Kit 66 S 2000AF line o.p. E1. SC940 E1. BU 10504 S E1. S 2000AF S E1.	
## 3	3 10p 12p 10p 10p 10p 10p 10p 10p 10p 10p 10p 10	R 4050 £1. S 2008h 8 2510898B £1. 2SC1942 £1. Hitachi sets etc. STR 454 £2. STR 6020 Kit £6 S 2000AF line α.p. £1 BU 10504 \$1 BU 108 £1	HT HT HT HT HT HT HT HT
BB 105A x 2	3 10p 12p 10p 10p 10p 10p 10p 10p 10p 10p 10p 10	2SD898B £1. 2SC1942 £1. Hitachi sets etc. STR.154 £2. STR.6020 Kit £6. S.2M0AF line cu.p. £1. 2SC940 £1. BU 105/04 \$8. BU 108 £1.	00
BB BB C C C C C C	3 10p 12p 10p 10p 10p 10p 10p 10p 10p 10p 10p 10	Hitachi sets etc. STR454 £2 STR6020 Kit £6 SJR00AF line o.p. £1 2SC940 £1 BU 10504 \$ BU 108 £1	HT7(N) £15.00 HD1000 Digital £20.00 HD1200 Low Cost Digital £13.00 HD2500 £18.40 HD3000 Digital £25.00 HD500 Digital £29.00
Lead \$1.50 BPV 4.00 BPV 4	2A/1000v G11 8p 50 15p 50 15p 50 15p 52 10p 54 54p 55 50 10p 56 50 10p 56 50 10p 57 50p 58 30 30p 56 2 10p 56 2 10p 56 2 10p 57 50 10p 58 50 10p 58 50 10p 58 50 10p	STR454	HD1200 Low Cost Digital £13.00 HD2500 E18.00 HD3000 Digital £25.00 HD5500 Digital £29.00
IA/16(N)V DG3P EQV-BY228 10 for \$1.00 GEC_2110 S7.00 BPW.45 SNE-4GJ02 St. 200 SNE-4GJ02 SNE-	2A/1000v G11	STR6020 Kit £6 S 2000/AF line o.p. £1 2SC940 £1 BU 105/04 8 BU 108 £1	.00 HD5500 Digital £29.00
DG3P EQV-BY228 10 for £1.00 Multiple Fee. Wire end SEE-4G20/2 Seq. WT71/600 50klns. 15p SEE-4G20/2 Seq. WT71/600 50klns. 15p SEE-4G20/2 Seq. WT71/600 50klns. 15p S	50 159 C 10p C 10p 24 54q 75 50p 18 30p 30 30p 56v2 10p 3v 10p viristor RCA 76122 £1,00	2SC940 £1 BU 105/04 8 BU 108 £1	
SKE4@202	30 30p 56v2 10p 3v 10p yristor RCA 76122 £1.00 mer 24lb/7lb-50lb/a 75n	BU 108 £1	.00 HD8000 Digital £35.00 HD9500 Digital with capacity Temp
Thorn Spares Section	30 30p 56v2 10p 3v 10p yristor RCA 76122 £1.00 mer 24lb/7lb-50lb/a 75n	BU 124	Trans Volts Ohms and Amps ranges 600 600
SWAP Traine panel 28.00 28.00 27.00 28.00 27.00 28.00 27.00 28.00 27.00 28.00 27.00 28.00 28.00 27.00 28.00 27.00 28.00 28.00 27.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00 28.00	3v 10p yristor RCA 76122 £1.00 mer 24lb/7/lbc-500lMa 75n	BU 126 8	Sop Infru Red
Sway regulated adaptor 240 vo.	mer 240v/20v-500Ma 75n	BU 204 6	Works at 24 feet – Sound repeater. Works off 9 volt battery Fits in top pocket.
Rank/Toshiba preh unit (1954 49.50 EHT Split Diode Leads ITT 4.00 Chush button unit preh f1.00 Chush button for CVCS ITT 8.00 Chush button for CVCS ITT 8.00 Chush button Unit Thorn f1.00 Chush button Unit Thorn f2.00 Chush button Unit Thorn f2.00 Chush button PYE 731 f2.00 Chush button Unit Thorn f2.00 Chush button PYE 731 f2.00 Chush button Unit GEC f2.00 Chush butto	mer 240v/20v-500Ma 75n	BU 206 £1.	Handset Tester with LED £4.50
Vicap. GEC-Deccatype F7.00 The property	ma Transference	BU 208 8	Repaired Handsets
KT3 12 Push button unit KT3 (Export) 12 P.B.u.	ype Transformer /olts 500m/a 75p ube base £2.00	BU 20ND 9 BU 222 £1.	00 Philips K4-K35, RC5350-RC5300, RC5370, RC5375, repaired same day £10.0
6 Push button GRC	se Rank & G11 £1.20	BU 407 6	RC5370, RC5375, repaired same day £10.0 RC4001 Full Remote KT3 K30 Teletext
6 Push button PVE 731	BRIDGES 30p	BU 500 £1.	Handsets exchanged £15.00
Rank 77184 PP.WILLEPS Decoder SAA IC SU20-S030 SA40 E-S040 E8.00 CVC 20-32 E5.00 E6.00	30p 30p	BU 500D £1. BU 508A 9	Mip GEC Pull Remote Intra-red, 1983 models
25.00 TUZ5 30K Rank 13.00 80/0 Pm	15p 15p	BU 508D 8	TOSHIRA HAND SETS
GP Philips \$4.00 GEC 2110 GEC 2110 \$4.00 GEC 2110 GEC 2110 \$4.00 GEC 2110 GEC 2	dges 2½ Amp 20p 30p	BU 705 £1.	
3500 Thom 23.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00	wer ASS 3 pots Mans Switch	BU 806A £1.	.00 Rediffusion MK3 £5.00
900 Thom 94.59 PHILIPS Decoder SAA IC 5020-5030 S040B-5050 K-40 Text Panel 95.800 Exercise 1 1.500 Exercise	£2.00	BUT II 5	Op TOSHBA
PHILIPS Decoder SAA IC 50/20-50/30 S040B-5050 E-40 Text Punel 1	wer Ass with pots cable forme	BUW II 5	00 HAND SETS 00 24 Button CT938 Fuliremote £5,00 32 Button CT983 Videotext £6,00
K-40 Text Punel \$8.00 Universal Tripler \$5.00 CVC20-32 Decra 80 100 \$4.50 Hills 9 pin	£1.00	BYW 2048-9 £1.	
CVC20-32 £5.00 Hills 9 pic	awer with 8 way pots. ass £2,50	BUX 39 25A-150V £1.	.00
KT3-K30 Grundig TVK 52 £2.50	ece tool kit in case £5.00	BUX 85	ф
OF-425 IITBQ Pye 731 £3.00 Philips C	paxial Cable Stripper SBC325	TIC 106a 3	GEC Ultrasonic 8CH Full Remote £10.00 GI Full Remote Ultrasonic £10.00
OF-555 E.W. 50p ITTHY \$4,00 OF-513 correction 10p D22 for Pye 18" colour portable \$4.00 OF-557 50p LP 1193/63 \$4.00 Calfornian	£7.50	TIC 116n/Y 1003 3	Op G11 Ultrasonic Teletext Handset £10.00 8 C.H. Ultrasonic GEC Full Remote
BG 10041 £3.25 Sen adjust ERO Tripler print type with foacs PO7	sting cutter stripper £5.00	TIC 225S 3	New Replacement for G11 Ultrasonic
Bridge KBF-08 BG2087 £5.00 10 mixed	tube bars £4.00	T1C 226m 3	On Decca RC 11 £5.00
BY 127 10n GEC 8 touch unti assy complete with all SIGN DIO	des-Resistors £3.00 pack		Decca RC 12 £14.00 G11 Infra-red full teletext £20.00 Dynatron-Full remote CTV 62, 63, 64
BY 133 10p IC.'s + pots 64.00 BY 134 10p G11 E.W. Transformer S0p *D/P pus 194 176 25p G11 E.W. coils \$1.00	h mains switch 20p each	(TIP2 case 2A/400V) 1 TIP 29 2	0p £19.00 £19.00
BY 179 40p G11 Transient Suppressors 245V 20p BY 184 25p G11 Sean Coils £5.00 Mains lea	d & two pin socket for radio	TIP 30 2 TIP 30A 2	Philips full remote KT3, 16C928/20C934; 7228/7324; K12 26C 797/1ST 66K 1826 £12.00
BY 187 Hop G11 100K tuner pots 12 for £1.00 cassette BY 190 40p KT3 IF panel £6.00	35р	TIP 30B 2 TIP 30C 2	Sp GEC infra red full remote 8 channel
BY 196 BY 198 BY 198 BY 198 BY 196 KT3/K30 infra-red receiver T/V loop	aerial 75p	TIP 32	Sp Philips infra red full remote 9 channel for 60 CP2605 £6.00 Philips infra red full remote 12 channel for 60 CP260S £12.00
	lescopic Aerial £1.00	TIP 33C 7	op for 60 CP2605 £12.00 op K35
BY 21(M400	icon Grease £1.50 each	TIP 34B 6	11
BY 223 BY 224/600: 4.8A/6000 bridge 60p KT3 line driver transformer 50p Oye, K30, GEC, etc. Pre-mains stand-by Fronte DE	nilips £1.50 each	TIP 35B 5	Op GEC infra-red 2236-2026 £4.00 GEC 8 button full remote £14.00 GEC push pad handset button blobs 10p
BY 226 [5p switch 11.00 11.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.0	aner Philips £1.50 each	TIP 35D 8	Op Dan & Philipp banders MT2 1/20 d
Flat BY 229 black 15p Trans. pair 25p pair 25p		TIP 36C 7	OP Special Price £13.00
	Reaner Philips £1.50 each	TIP4IB 4	5p RC4001 KT3 and Teletex £14.00 1T CVC 32 handset repaired £15.00 CVC 32 Hand Set £15.00 CVC 45 3 and 2 Pin
BY 237 5p G118 touch button unit replaces old 6 100 Coax	Plugs EACH 14p	TIP 42 1	"P IAIU Hand Set Text £12.50
	pump + 2 nozzles Philips £4.00	TIP 48 4	0p TX9 with Text £12.50 0p TX9 & TX10 button print £2.00 TX10 Focus Pots £5,50
8p Portable £3.00 CVC 20/25/30/35/40 decoder panel £10.00		TIP 57 3	Op ITT
BY 407a 10p CVC 20/25/30/35/40 decoder panel (untested) 25.00	LED and Green 5p	TIP 102 3	Op Diff IPS
BY 500/200 — 5 amp	40 Solder reel £6.00	TIP 115 5	UNIVERSAL HAND SET £12.00 RC5 0p KT3 – K45
BYV 26C 10p LM337M Reg. 30p Dual v/u i		T1P (25 3.	
GPPBING (TX 10) Sp K13 Front Panel Control ASSV. £2.50 K30 Ther	neter-20 — +10db £1.00		An
XK 3102 50p BTW 30/50 50p		TIP 126 TIP 127 TIP 130 TIP 131	0p RC5353 £15.00
Bridge TX10 800/3 amps 30p KBPC35-02 Bridge €1.50 Prortacol F	mistor 232266298009 75p	TIP 126 4 TIP 127 4 TIP 130 3 TIP 131 7 TIP 136 3 TIP 140 5	40
Bridge Rec. D35B10 40p	mistor 23226629NN9 75p Pump £2.50	TIP 126 4 TIP 127 TIP 127 TIP 130 TIP 131 TIP 136 TIP 140 TIP	0 0 0 0 0 0 0 0 0 0 0 0 0
	mistor 232266298009 75p	TIP 126 4 TIP 127 TIP 127 TIP 130 TIP 131 TIP 136 TIP 140 TIP	00 RC5353
International Rectifier EHT Diodes G770/HV34 6KV 6A/600V Stud Diodes 20p BTW 92/800R £3.00	mistor 23/2266298899 75p Pump £2.50 Pameless Gas Soldering Iron ££16.00	TIP 126	00 RC\$353 £15.00 RC\$300 £12.00 E12.00 E12.00
6A/1000V Stud Diodes 20p 25A473 PNP C/P 10p Hill Mete Probes	### ##################################	TIP 126 TIP 127 TIP 130 TIP 131 TIP 136 TIP 136 TIP 136 TIP 140 TIP 142 TIP 640 TIP 640 TIP 2955 TIP 1761A-1000V/4Amp 77 TR6430 TR6430 TR6430 TR6437 TR6439	00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

TUNER UNITS TX96-TX 100 Tuners with AE sacket £5.06. Thorn TX Tuner VCap equ. to ELC 1043 #4.50 #5 x 1 1/2 x 1 1/2 AMSTRAD Tuner TATION TX 10 Export VCap UHF. VIII VCap Rank UHF Z776/TUnit VCap Rank UHF Z775/TUnit MEW G8 Tuner VCap #5.00 MCap Rank UHF Z775/TUnit MCW G8 Tuner VCap #5.00 MCGP Rank UHF Z775/TUnit MCW G8 Tuner VCap #5.00 MCGP Rank UHF Z775/TUnit MCGP C800 MCGP Rank UHF Z775/TUnit MCGP C800 MCGP	SENDZ COMPONENTS	THORN ML926 MAR840P-C MAR840P-O700 MAR840P-D700 MAR840P-D	TBA625 Sup TBA627 E2.00 TBA673 E1.00 TBA673 E1.00 TBA673 E1.00 TBA673 E1.00 TBA673 E1.00 TBA781 E1.59 TBA781 E1.59 TBA781 E1.59 TBA781 E1.59 TBA781 E1.50 TMS1943 NIL (clockchip) E1.00 TMS1941 E1.00 TMS1941 E1.00 TMS1941 E1.00 TMS1941 E1.00 UPC1364C E2.00 UPC1364C E2.00 UPC1364C E2.00 UPC1364C E2.00 UPC13781 E2.00 UPC	TDA2577A
BFT134 BFT134 BFT134 BFT134 BFT134 BFFT34 BFFT34 BFFY11 BFFX29 BFFY20 BFFY20 BFFY52 BFFY54 BFY55 BFY55 BFY56 BFY49 BFY56 BFY49 BFY56 BFY56 BFY79 BFY56 BFY79 BFY56 BFY79 BFY795 BFY795 BFY79 BFY795 BFY795 BFY79 BFY795 BFY795 BFY795 BFY795 BFY79 BFY795 BFY796 BFY790 BFY796 BFY796 BFY796 BFY796 BFY796 BFY796 BFY796 BFY796 BFY790 BFY796 BFY90 BFY796 BFY9	15	SAA 2234 P/A TEX IC £5.00 SAFIU39 £2.00 SAFIU39 £2.00 SAFIU39 £2.00 SASSUT 750 SASSON 75	\$N767291 \$1.00 \$N76719N\$ £2.00 UA783P3C 40p BT183710A 302 BT183710A 70p BT183710A 70p BT1846 90p TBA540C £1.51 TCA270 £1.60 TCA270S £1.90 TCA370S £1.90 TCA370S £1.90 TCA370S £1.90 TCA370S £1.90 TCA300 £1.90 TCA480 £1.90 TCA480 £1.90 TCA480 £1.90 TCA520 £1.90 TDA1003A £1.90 TDA1003A £1.90 TDA1003A £1.90 TDA1003A £1.90 TDA1003A £1.90 TDA1151 \$1.90 TDA1151 \$2.00 TDA151 \$1.90 TDA151 \$1.90 TDA151 \$1.90 TDA151 \$1.90 TDA151 \$2.00 TDA151 \$2.00 TDA151 \$2.00 TDA151 \$2.00 TDA151 \$2.00 TDA151 \$2.00 TDA1520 £1.90 TDA1601 £2.90 TDA15201 £1.90 TDA2600 £2.90 TDA2501 £1.90 TDA2502 £1.90 TDA2503 £1.90 TDA2503 £1.90 TDA2504 £1.90 TDA2505 £1.90 TDA2555 £1.90 TDA2555 £1.90 TDA2555 £1.90 TDA2555 £1.90 TDA2557 £1.90 TDA2575 £	SN (16964AN SUp SN 29764AN SUP UA7301 40p UA7301 40p MP\$43 A 25p MISSIT 25p MISSIT 25p MIESIT 32p MIESIT