

SCHEMATEEK

Beh. T. Hultermans
Postbus 4228
5604 EE Eindhoven

SPECIFICATIONS



GENERAL

Frequency Range:

160 meter band	1.80 to 2.00 MHz
80 meter band	3.50 to 4.00 MHz
40 meter band	7.00 to 7.30 MHz
20 meter band	14.00 to 14.35 MHz
15 meter band	21.00 to 21.45 MHz
10 meter band	28.00 to 29.70 MHz
WWV	10.0 MHz (receive only)
AUX 2BAND	A: 2.0 to 15.0 MHz each 500 kHz band
	B: 18.0 to 18.5 MHz
	C: 25.0 to 25.5 MHz

Mode:

SSB(A3J), CW(A1), FSK(F1)

Voltage Requirements:

11.0VDC to 16.0VDC
(13.8VDC nominal)

Power Consumption (at 13.8 VDC VSWR less than 1.5:1):

	TS-180 (TS-180S)	TS-180S (with D.F.C)
Receive	1.2 A	1.6 A
Transmit	19.6 A	20 A

Semiconductor Complement:

	TS-180 (TS-180S)	TS-180S (with D.F.C)
Transistors	143	177
FETS	21	26
ICS	33	53
Diodes	203	240

Dimensions: (Projections not included)

325(12-13/16") wide x 133(5-1/4") high
x 287(11-5/16") deep

Weight:

	TS-180 (TS-180S)	TS-180S (with D.F.C)
	11.0 kg (24.2 lbs)	11.5 kg (25.3 lbs)

TRANSMITTER SECTION

Input Power:

	160 to 15 meters band	10 meters band
SSB	200 Watts PEP	160 Watts PEP
CW	160 Watts PEP	140 Watts DC
FSK	100 Watts DC	50 Watts DC

Antenna Impedance:

50 Ohms

Carrier Suppression:

Carrier better than 40 dB down from the output signal

Unwanted Sideband Suppression:

Unwanted sideband is better than 60 dB down from the output signal

Harmonic Radiation:

Better than 40 dB down from output signal

Spurious Radiation:

Better than 50 dB down from output signal

Microphone Impedance:

500Ω to 50 kΩ

Transmitter AF response:

400 to 2600 kHz

RECEIVER SECTION

Receiver Sensitivity:

0.25μV S+N/N 0 dB or more

Image Rejection:

Image frequency better than 60 dB down from the output signal

IF Rejection:

IF frequency is 80 dB or more down from output signal

Frequency Stability:

Within ±1 kHz during the first hour after 1 minute of warmup
Within 100 Hz during any 30 minute period after warmup

Receiver Selectivity:

SSB, CW WIDE
2.4 kHz (-6 dB)
4.2 kHz (-60 dB)
CW NAR, FSK (With optional filter YK-88C)
0.5 kHz (-6 dB)
1.8 kHz (-60 dB)

Audio Output:

More than 2 watts (with less than 10% distortion) into an 4 ohm load.

AF Output Impedance:

4 to 16 ohms (speaker or headphones)

FEATURES

1. DFC (Digital Frequency Control), with four tunable memories.

- Memories are usable in transmit and or receive modes. Split-frequency operation is possible with TS-180S VFO and any one of the memories, with TS-180S VFO and optional VFO-180 external VFO, and with a DFC memory and VFO-180.

- Memories can store frequencies from the TS-180S VFO, FIX CH, and VFO-180. Also, frequencies can be transferred between memories.

- Memory-shift paddle switches allow any of the memory frequencies to be tuned in 20-Hz steps up or down, slow or fast, with recall of the original stored frequency.

2. High-performance solid-state final.

- No dipping or loading. Just dial up the frequency, peak the drive, and operate.

- High power...200 W PEP/160 W DC input on 160-15 meters, and 160 W PEP/140 W DC on 10 meters.

- Highly reliable, with large heatsink.

- Final transistors (two SFR1714s, each with PC=250 W) are manufactured by Motorola to Kenwood's specifications.

- Double protection circuits. If the VSWR is more than 10:1, transmit power is automatically reduced to about 1/10 of normal. Also, if the temperature of the core of the transmit output coil rises abnormally, transmit power is reduced to about 1/10 of normal.

3. Covers 160-10 meters, with provisions for WARC allocations.

- Transceivers on 160, 80/75, 40, 20, 15, and all of 10 meters.

- Receives WWV on 10 MHz

- Adaptable, by installing additional parts to three new bands, if they should be made available at the World Administrative Radio Conference. AUX 1 and AUX 2 as well as the WWV positions are provided on the BAND switch for this purpose.

- The TS-180S VFO covers more than 50 kHz above and below each band, for MARS and other applications, and thus will accommodate shifts and expansions of existing bands that might be made at WARC.

4. Built-in microprocessor-controlled large digital display.

- Shows actual VFO frequency.

- Digital display memory and display of frequency difference. With DSP/M switch turned on when the DSP/DIFF switch is depressed, the frequency that was displayed is memorized and shown at the left side of the digital display, and the difference between the

85

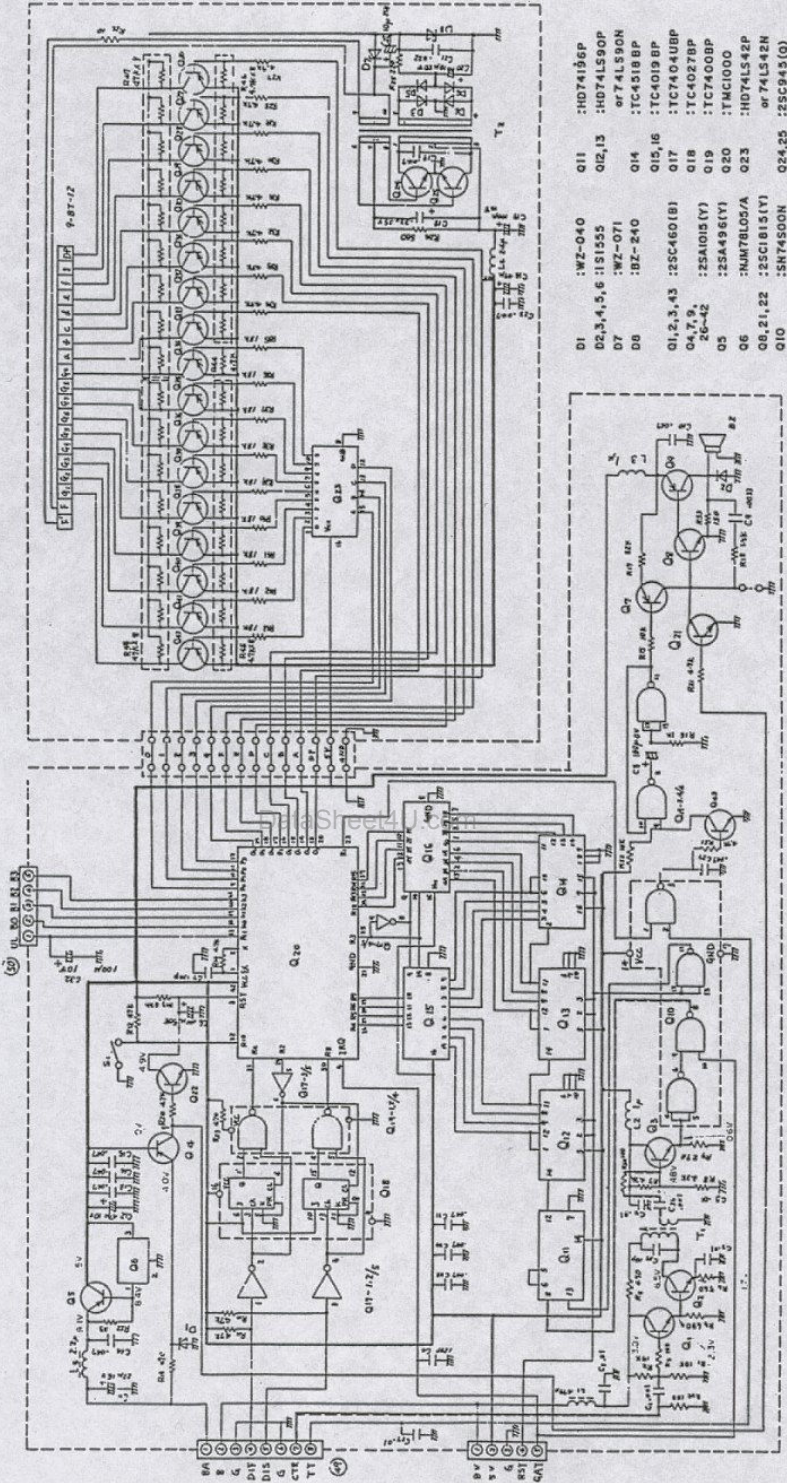
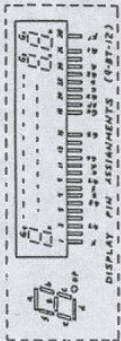
TS-180S

KENWOOD

▼ COUNTER ASS'Y UNIT (X60-1100-00)

▼ DISPLAY UNIT (X54-1430-00)

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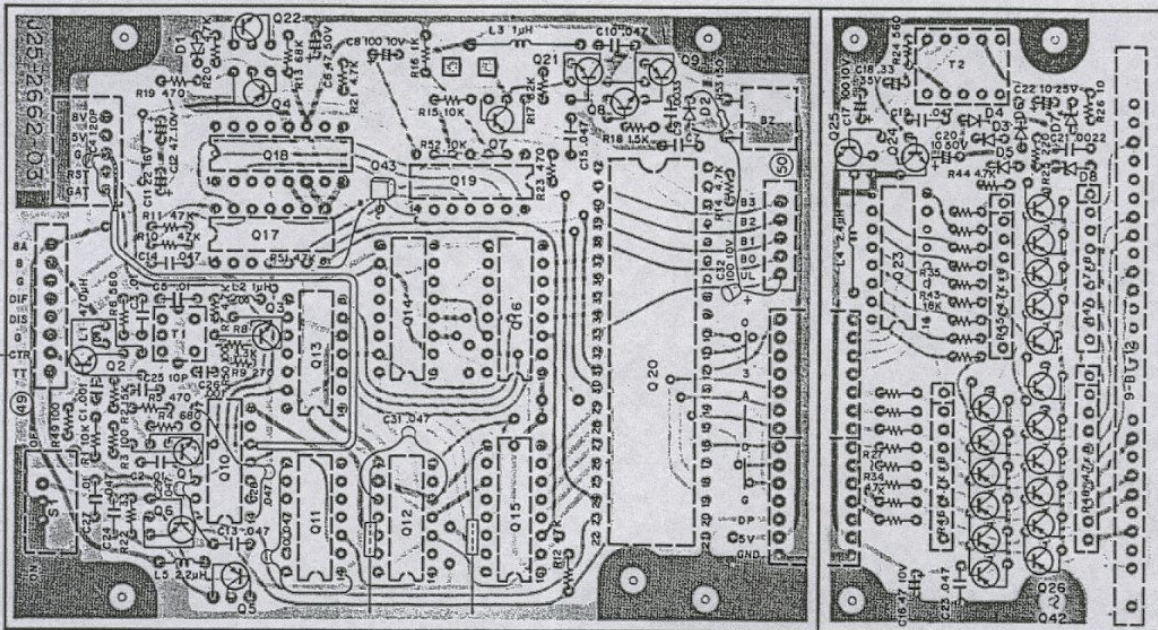


DI	:WZ-040	Q11	:HD74136P
D2,3,4,5,6	:1S1555	Q12,13	:HD74LS90P or 74LS90N
D7	:WZ-071	Q14	:TC4518BP
D8	:BZ-240	Q15,16	:TC4013BP
Q1,2,3,4,5	:25C460(B)	Q17	:TC7404UBP
Q4,7,9,26-42	:25A1015(Y)	Q18	:TC4027BP
Q5	:25A496(Y)	Q19	:TC7400BP
Q6	:NM78105(A)	Q20	:TAC1000
Q8,21,22	:25C1815(Y)	Q23	:HD74LS42P or 74LS42N
Q10	:SR74500N	Q24,25	:25C945(Q)

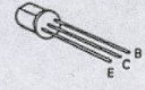
From Premix unit

▼ COUNTER ASS'Y UNIT (X60-1100-00)

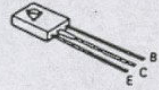
▼ DISPLAY UNIT (X54-1430-00)



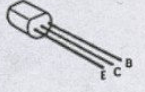
2SC460(B)
2SC733(Y)



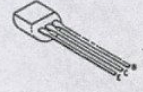
2SA496(Y)



2SC945(Q)



2SC1815(Y)
2SA1015(Y)



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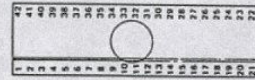
HD74LS42P
TC4019BP
TC4027BP
TC4518BP

NJM78L05/A



SN74S00
HD74196P
HD74LS90P
TC7400BP
TC7404UBP

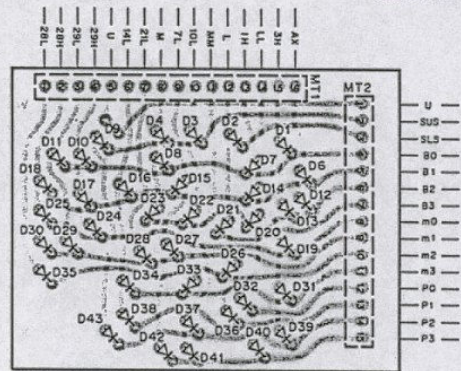
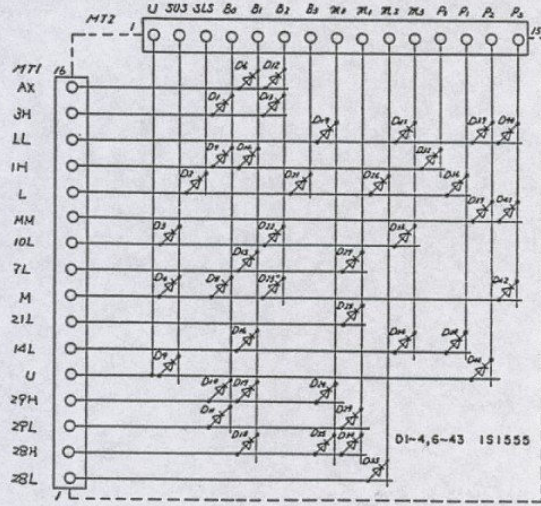
TMC1000



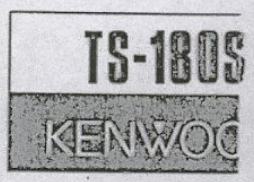
▼ PLL ASS'Y UNIT (X60-1120-00)

▼ MATRIX UNIT (X53-1130-00) PARTS LIST: Page 48

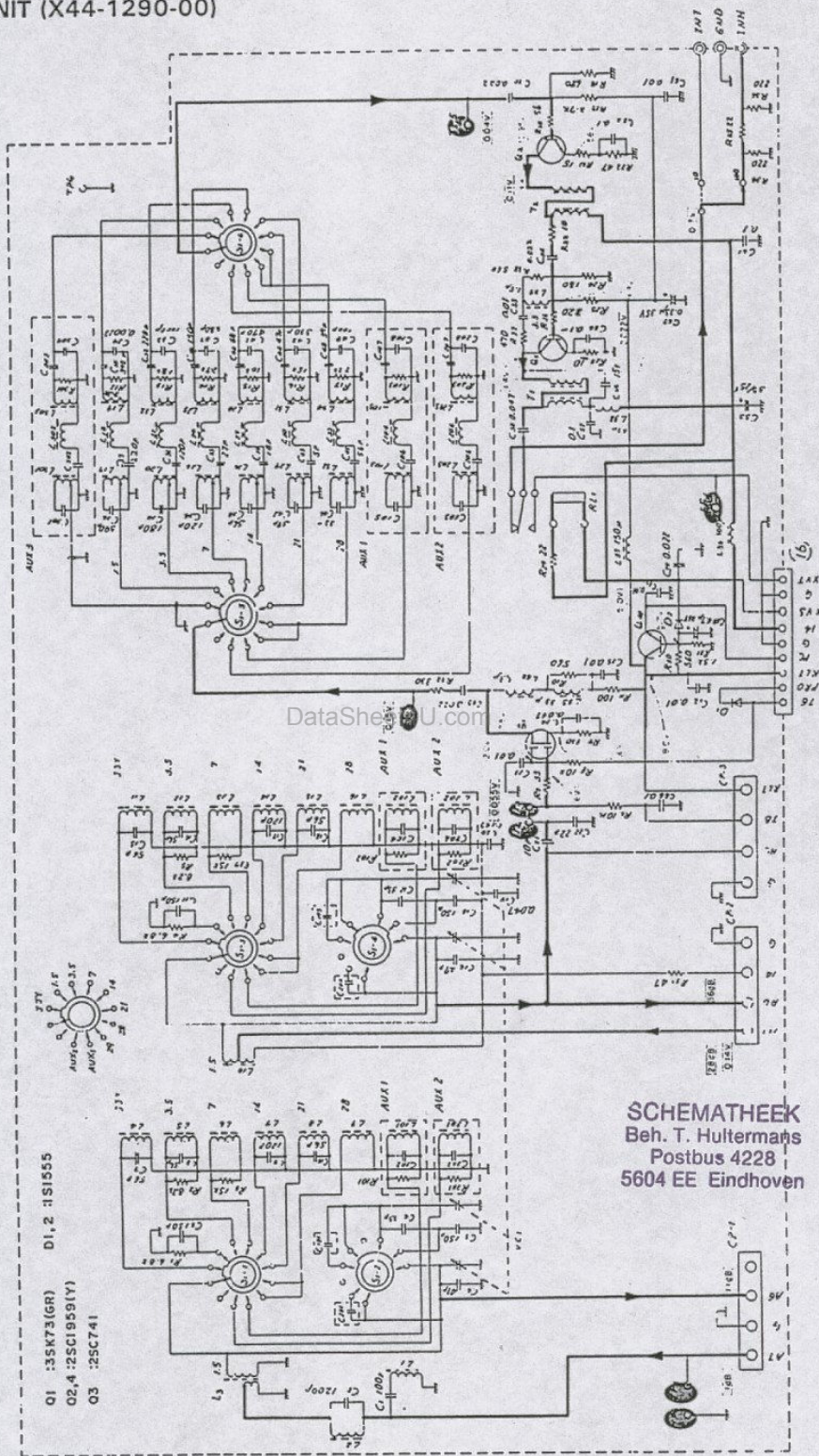
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Not used D1, 15, 20 (K) type
Not used D13, 20 (W)(T)(X) type



▼ COILPACK UNIT (X44-1290-00)

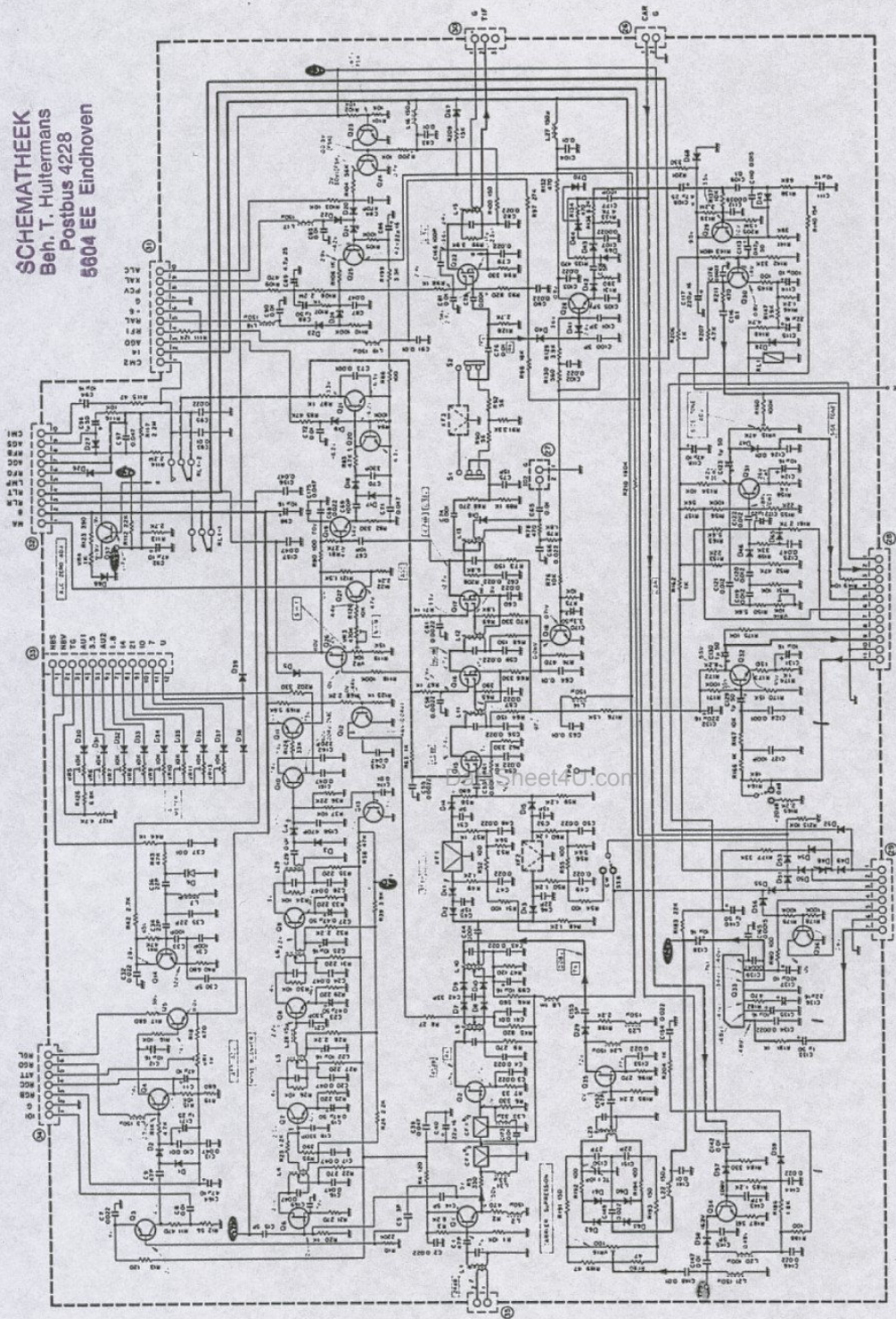


- Q1 :5SK73(GR)
- Q2,4 :25C1999(Y)
- Q3 :25C741

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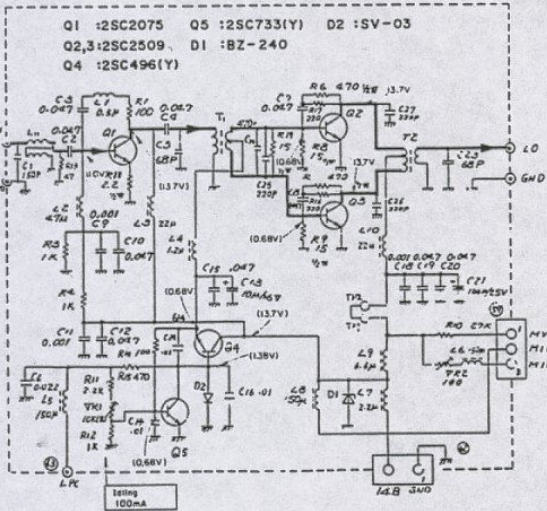
IF UNIT (X48-1240-11)

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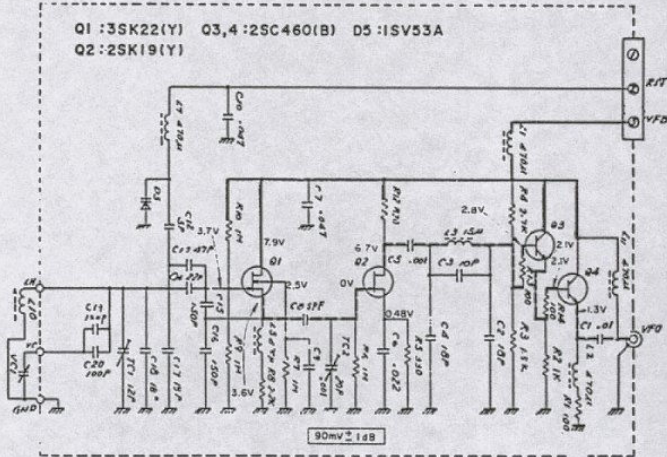


6X1, 6X2, 6X3, 6X4, 6X5, 6X6, 6X7, 6X8, 6X9, 6X10, 6X11, 6X12, 6X13, 6X14, 6X15, 6X16, 6X17, 6X18, 6X19, 6X20, 6X21, 6X22, 6X23, 6X24, 6X25, 6X26, 6X27, 6X28, 6X29, 6X30, 6X31, 6X32, 6X33, 6X34, 6X35, 6X36, 6X37, 6X38, 6X39, 6X40, 6X41, 6X42, 6X43, 6X44, 6X45, 6X46, 6X47, 6X48, 6X49, 6X50, 6X51, 6X52, 6X53, 6X54, 6X55, 6X56, 6X57, 6X58, 6X59, 6X60, 6X61, 6X62, 6X63, 6X64, 6X65, 6X66, 6X67, 6X68, 6X69, 6X70, 6X71, 6X72, 6X73, 6X74, 6X75, 6X76, 6X77, 6X78, 6X79, 6X80, 6X81, 6X82, 6X83, 6X84, 6X85, 6X86, 6X87, 6X88, 6X89, 6X90, 6X91, 6X92, 6X93, 6X94, 6X95, 6X96, 6X97, 6X98, 6X99, 6X100	35K731GHI	D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100	25C-4001B1 25C-4001B2 25C-4001B3 25C-4001B4 25C-4001B5 25C-4001B6 25C-4001B7 25C-4001B8 25C-4001B9 25C-4001C1 25C-4001C2 25C-4001C3 25C-4001C4 25C-4001C5 25C-4001C6 25C-4001C7 25C-4001C8 25C-4001C9 25C-4001D1 25C-4001D2 25C-4001D3 25C-4001D4 25C-4001D5 25C-4001D6 25C-4001D7 25C-4001D8 25C-4001D9 25C-4001E1 25C-4001E2 25C-4001E3 25C-4001E4 25C-4001E5 25C-4001E6 25C-4001E7 25C-4001E8 25C-4001E9 25C-4001F1 25C-4001F2 25C-4001F3 25C-4001F4 25C-4001F5 25C-4001F6 25C-4001F7 25C-4001F8 25C-4001F9 25C-4001G1 25C-4001G2 25C-4001G3 25C-4001G4 25C-4001G5 25C-4001G6 25C-4001G7 25C-4001G8 25C-4001G9 25C-4001H1 25C-4001H2 25C-4001H3 25C-4001H4 25C-4001H5 25C-4001H6 25C-4001H7 25C-4001H8 25C-4001H9 25C-4001I1 25C-4001I2 25C-4001I3 25C-4001I4 25C-4001I5 25C-4001I6 25C-4001I7 25C-4001I8 25C-4001I9 25C-4001J1 25C-4001J2 25C-4001J3 25C-4001J4 25C-4001J5 25C-4001J6 25C-4001J7 25C-4001J8 25C-4001J9 25C-4001K1 25C-4001K2 25C-4001K3 25C-4001K4 25C-4001K5 25C-4001K6 25C-4001K7 25C-4001K8 25C-4001K9 25C-4001L1 25C-4001L2 25C-4001L3 25C-4001L4 25C-4001L5 25C-4001L6 25C-4001L7 25C-4001L8 25C-4001L9 25C-4001M1 25C-4001M2 25C-4001M3 25C-4001M4 25C-4001M5 25C-4001M6 25C-4001M7 25C-4001M8 25C-4001M9 25C-4001N1 25C-4001N2 25C-4001N3 25C-4001N4 25C-4001N5 25C-4001N6 25C-4001N7 25C-4001N8 25C-4001N9 25C-4001O1 25C-4001O2 25C-4001O3 25C-4001O4 25C-4001O5 25C-4001O6 25C-4001O7 25C-4001O8 25C-4001O9 25C-4001P1 25C-4001P2 25C-4001P3 25C-4001P4 25C-4001P5 25C-4001P6 25C-4001P7 25C-4001P8 25C-4001P9 25C-4001Q1 25C-4001Q2 25C-4001Q3 25C-4001Q4 25C-4001Q5 25C-4001Q6 25C-4001Q7 25C-4001Q8 25C-4001Q9 25C-4001R1 25C-4001R2 25C-4001R3 25C-4001R4 25C-4001R5 25C-4001R6 25C-4001R7 25C-4001R8 25C-4001R9 25C-4001S1 25C-4001S2 25C-4001S3 25C-4001S4 25C-4001S5 25C-4001S6 25C-4001S7 25C-4001S8 25C-4001S9 25C-4001T1 25C-4001T2 25C-4001T3 25C-4001T4 25C-4001T5 25C-4001T6 25C-4001T7 25C-4001T8 25C-4001T9 25C-4001U1 25C-4001U2 25C-4001U3 25C-4001U4 25C-4001U5 25C-4001U6 25C-4001U7 25C-4001U8 25C-4001U9 25C-4001V1 25C-4001V2 25C-4001V3 25C-4001V4 25C-4001V5 25C-4001V6 25C-4001V7 25C-4001V8 25C-4001V9 25C-4001W1 25C-4001W2 25C-4001W3 25C-4001W4 25C-4001W5 25C-4001W6 25C-4001W7 25C-4001W8 25C-4001W9 25C-4001X1 25C-4001X2 25C-4001X3 25C-4001X4 25C-4001X5 25C-4001X6 25C-4001X7 25C-4001X8 25C-4001X9 25C-4001Y1 25C-4001Y2 25C-4001Y3 25C-4001Y4 25C-4001Y5 25C-4001Y6 25C-4001Y7 25C-4001Y8 25C-4001Y9 25C-4001Z1 25C-4001Z2 25C-4001Z3 25C-4001Z4 25C-4001Z5 25C-4001Z6 25C-4001Z7 25C-4001Z8 25C-4001Z9	15V233A 15V233B 15V233C 15V233D 15V233E 15V233F 15V233G 15V233H 15V233I 15V233J 15V233K 15V233L 15V233M 15V233N 15V233O 15V233P 15V233Q 15V233R 15V233S 15V233T 15V233U 15V233V 15V233W 15V233X 15V233Y 15V233Z	15V233A 15V233B 15V233C 15V233D 15V233E 15V233F 15V233G 15V233H 15V233I 15V233J 15V233K 15V233L 15V233M 15V233N 15V233O 15V233P 15V233Q 15V233R 15V233S 15V233T 15V233U 15V233V 15V233W 15V233X 15V233Y 15V233Z	15V233A 15V233B 15V233C 15V233D 15V233E 15V233F 15V233G 15V233H 15V233I 15V233J 15V233K 15V233L 15V233M 15V233N 15V233O 15V233P 15V233Q 15V233R 15V233S 15V233T 15V233U 15V233V 15V233W 15V233X 15V233Y 15V233Z
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▼ 10 W FINAL UNIT (X56-1330-00)

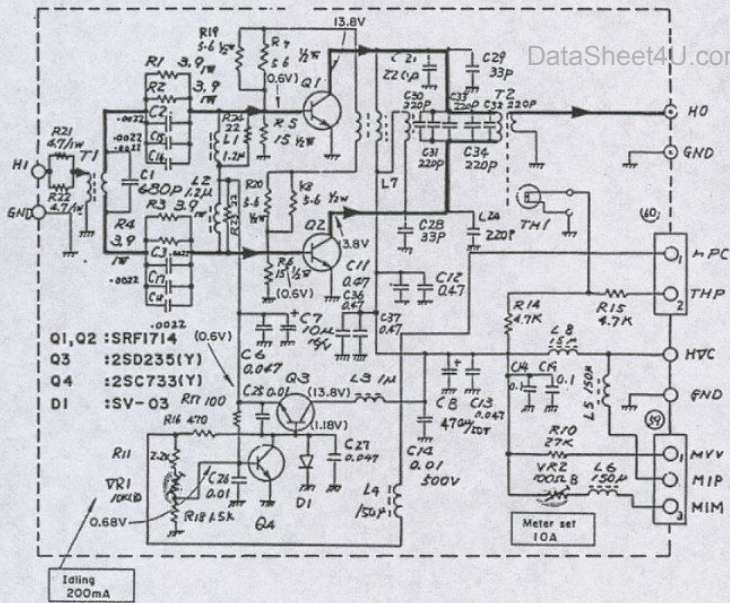


▼ VFO UNIT (X40-1140-00)



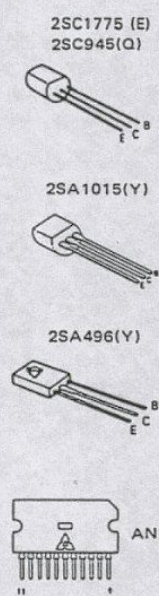
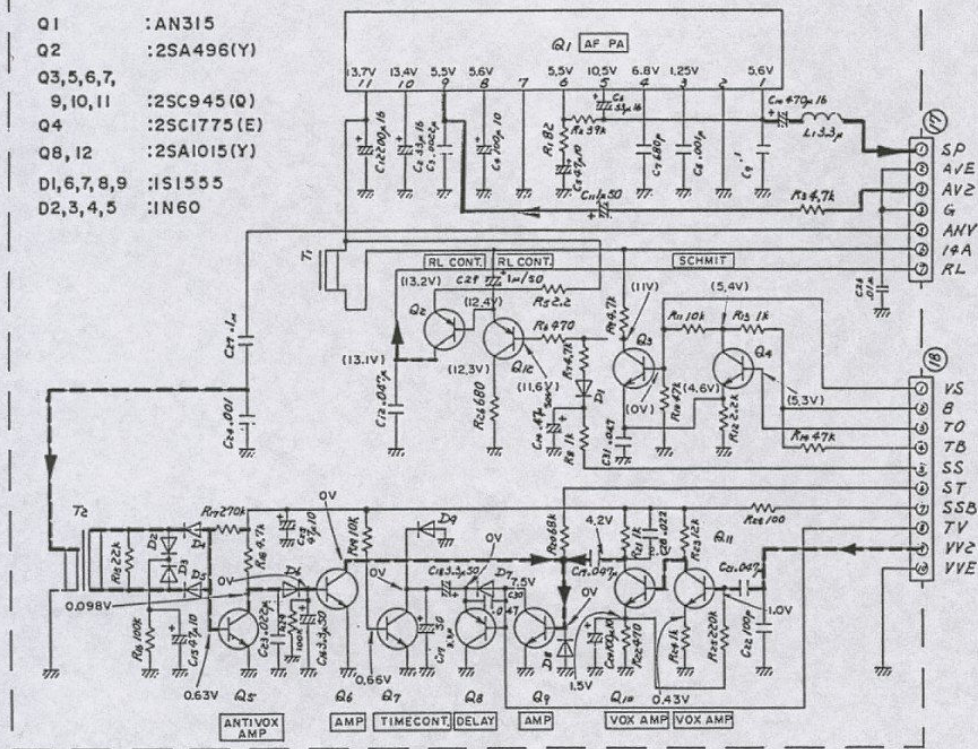
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▼ 100 W FINAL UNIT (X56-1340-00)



▼ AF VOX UNIT (X49-1130-00)

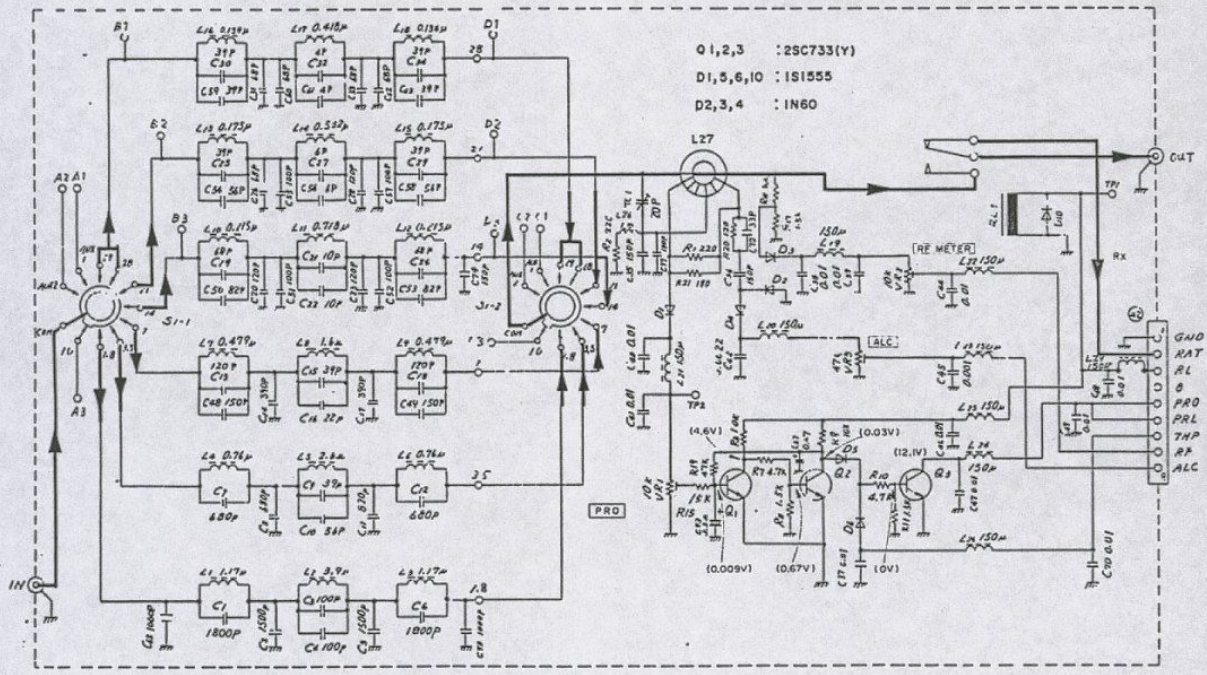
- Q1 : AN315
- Q2 : 2SA496(Y)
- Q3,5,6,7, 9,10,11 : 2SC945(Q)
- Q4 : 2SC1775(E)
- Q8,12 : 2SA1015(Y)
- D1,6,7,8,9 : 1S1555
- D2,3,4,5 : 1N60



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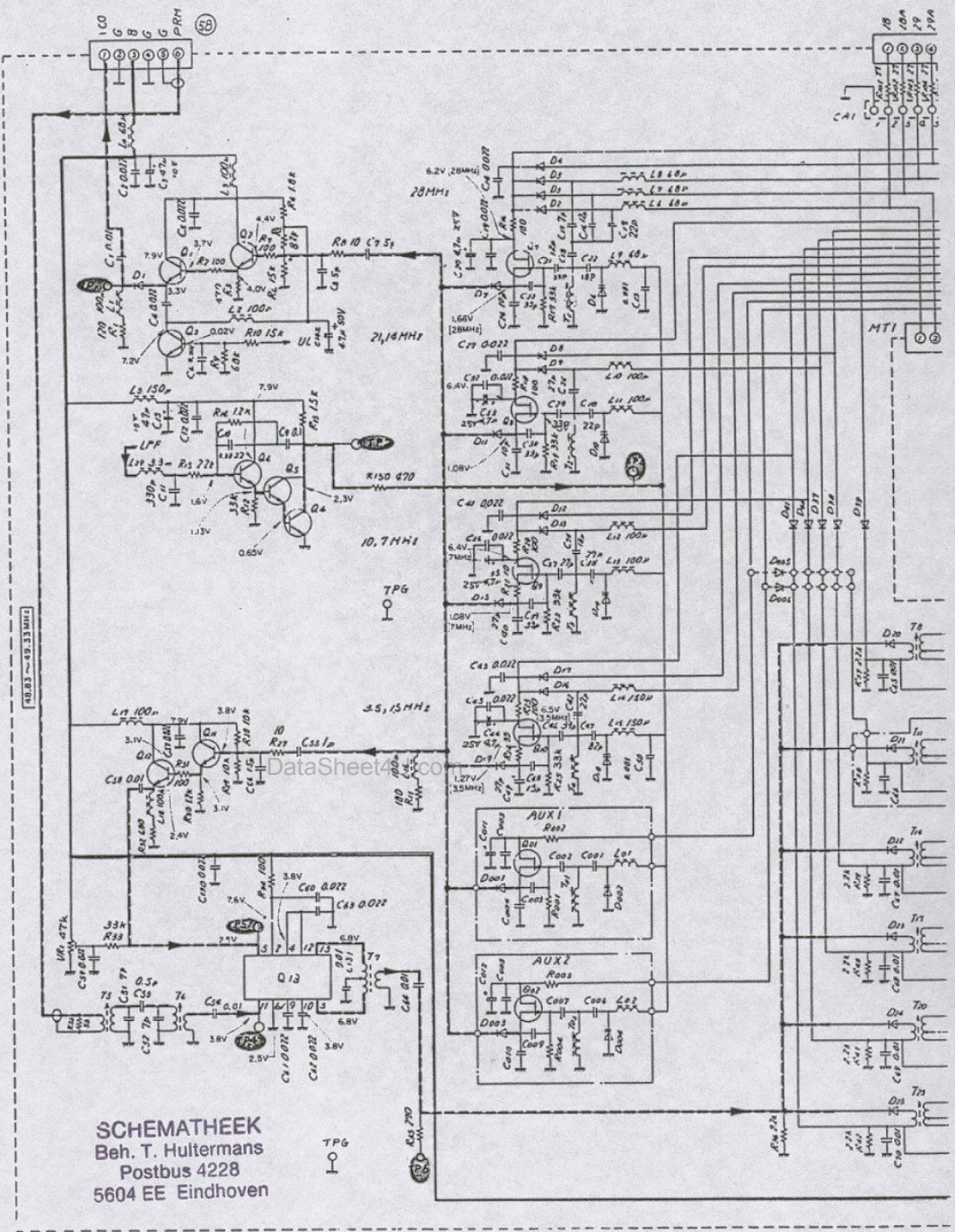
▼ LPF UNIT (X51-1180-00)

- Q1,2,3 : 2SC733(Y)
- D1,5,6,10 : 1S1555
- D2,3,4 : 1N60



A

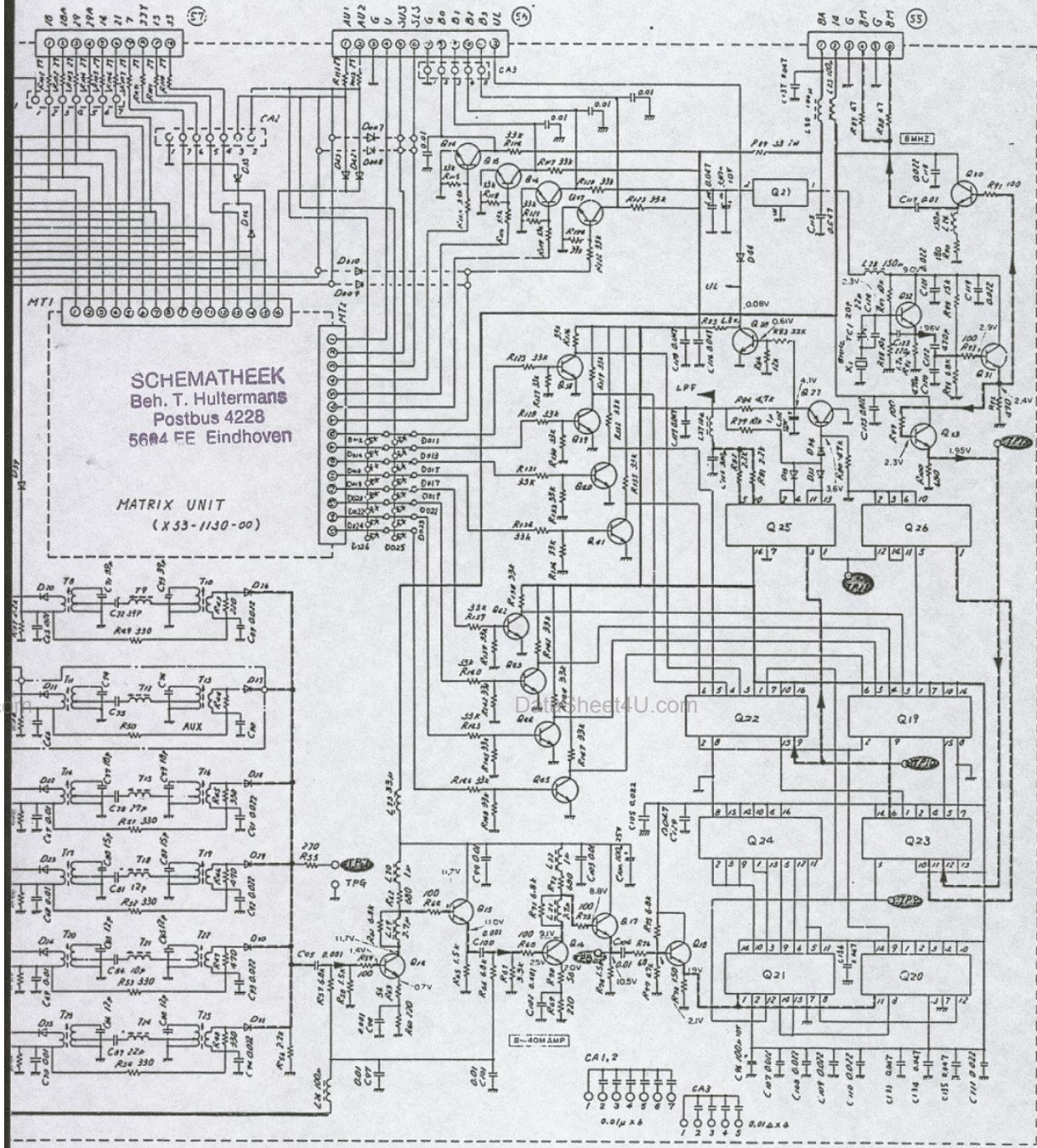
- ▼ PLL ASS'Y UNIT (X60-1120-00)
- ▼ PLL UNIT (X50-1560-00)



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Q01, 02, 8-10 : 2SK19(GR)	Q4-6 : 2SC1775(E)	Q19, 22 : SN74LS163N or HD74LS163P or 74LS1
Q1, 2, 14, 16 : 2SC1907	Q7 : 2SK19(BL)	Q20 : SN74574N or HD74574
Q3, 28 : 2SC945(Q)	Q11, 12, 15, 17, 18, 31-33 : 2SC460(B)	Q21 : SN74S00N or HD74S00
	Q13 : SN76514N	Q23 : SN74LS00N or HD74LS00P or 74LSOC
		Q24 : SN74S112N or HD74S112
		Q25 : MC4044P

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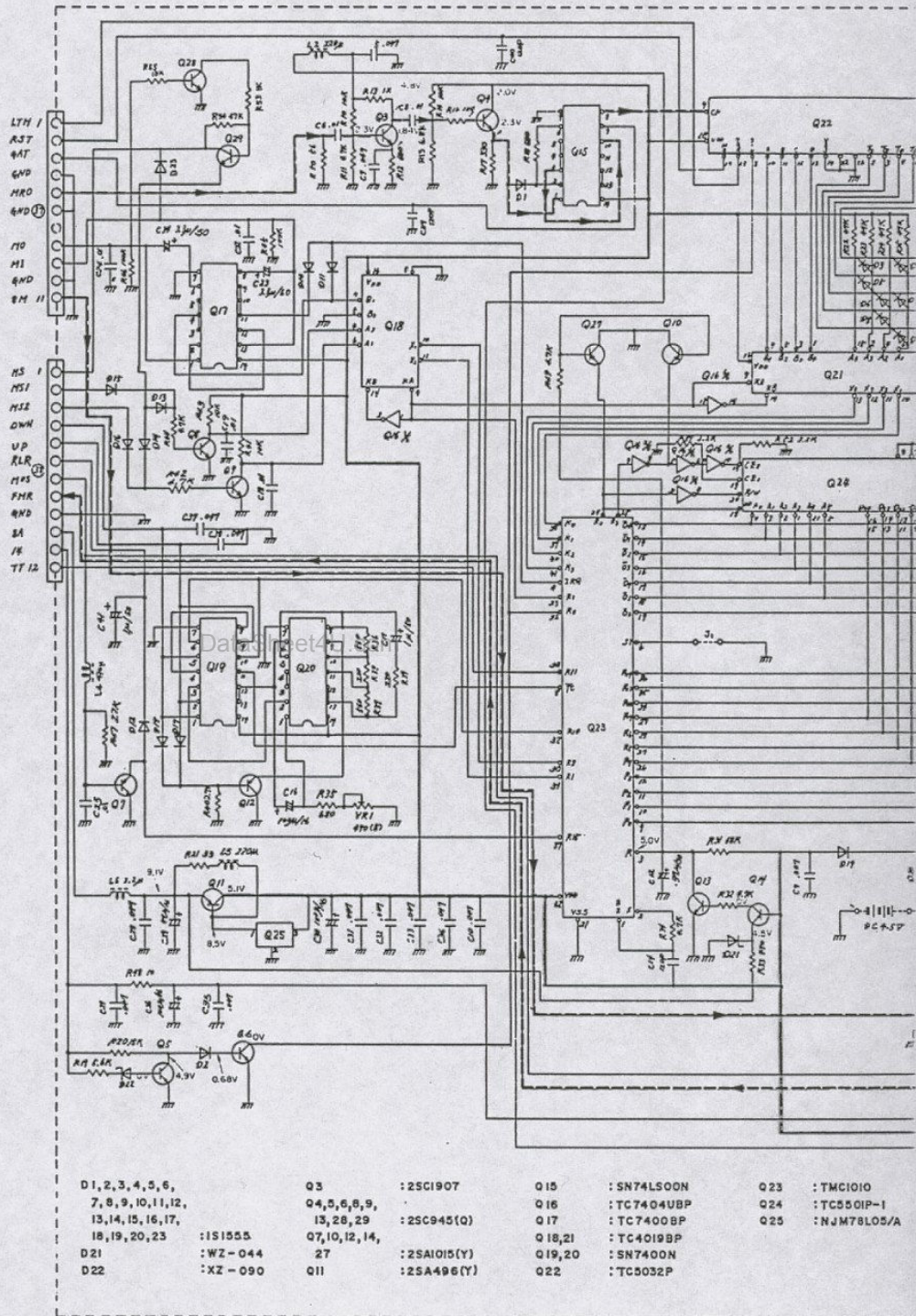
MATRIX UNIT
(X 53-1130-00)

3P or 74LS163N	Q26 :SN74LS93N or HD74LS93P or 74LS93N	D1~3	D4, 7	D6, 10, 14
3P or 74LS00N	Q27 :2SA1015(Y)	5, 9	8, 11	18, 002
	Q29 :FS 7805	13, 16	12, 15	004 :15V53A
	Q30 :25CI959(Y)		17, 19	D20, 22-26
			32~44	28~31 :151587
			001, 003	
			005-026 :151555	

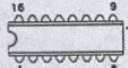
B

▼ MEMORY ASS'Y UNIT (X60-1090-00)
 ▼ CONTROL UNIT (X53-1100-00)

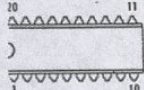
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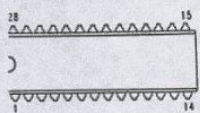
TC4518BP
 TC9122P
 TC4019BP



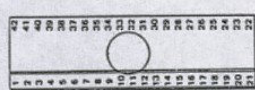
TC5501P-1



TC5032P



TMC1010



B

M

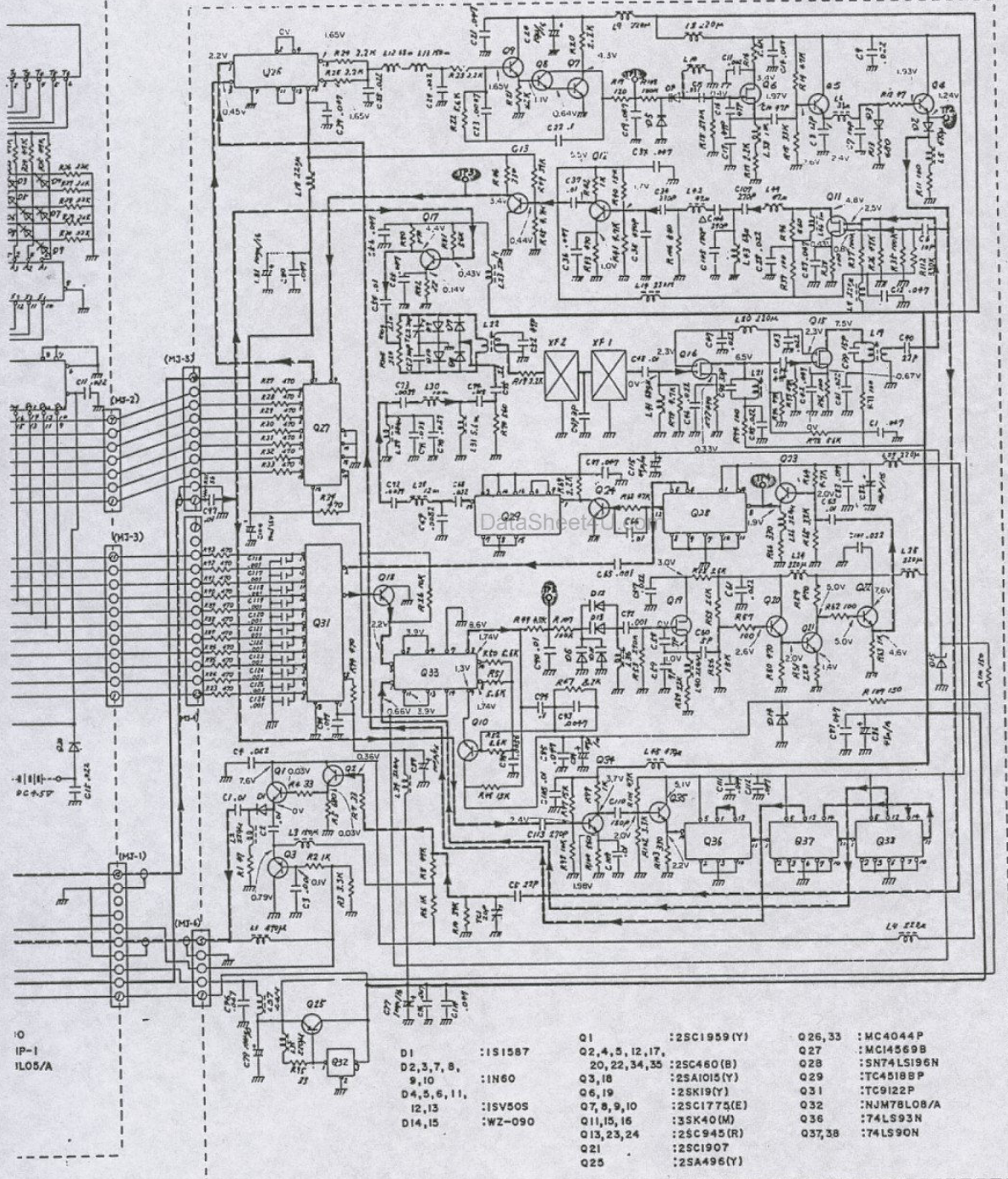
N

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P

▼ VCO UNIT (X50-1550-00)

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D1, 3, 7, 8, 9, 10	: 1N60	Q1	: 2SC1959(Y)	Q26, 33	: MC4044P
D4, 5, 6, 11, 12, 13	: 1SV50S	Q2, 4, 5, 12, 17, 20, 22, 34, 35	: 2SC460(B)	Q27	: MC14569B
D14, 15	: WZ-090	Q3, 18	: 2SA1015(Y)	Q28	: SN74LS196N
		Q6, 19	: 2SK19(Y)	Q29	: TC4518BP
		Q7, 8, 9, 10	: 2SC1775(E)	Q31	: TC9122P
		Q11, 15, 16	: 3SK40(M)	Q32	: NJM78L09/A
		Q13, 23, 24	: 2SC945(R)	Q36	: 74LS93N
		Q21	: 2SC1907	Q37, 38	: 74LS90N
		Q25	: 2SA496(Y)		

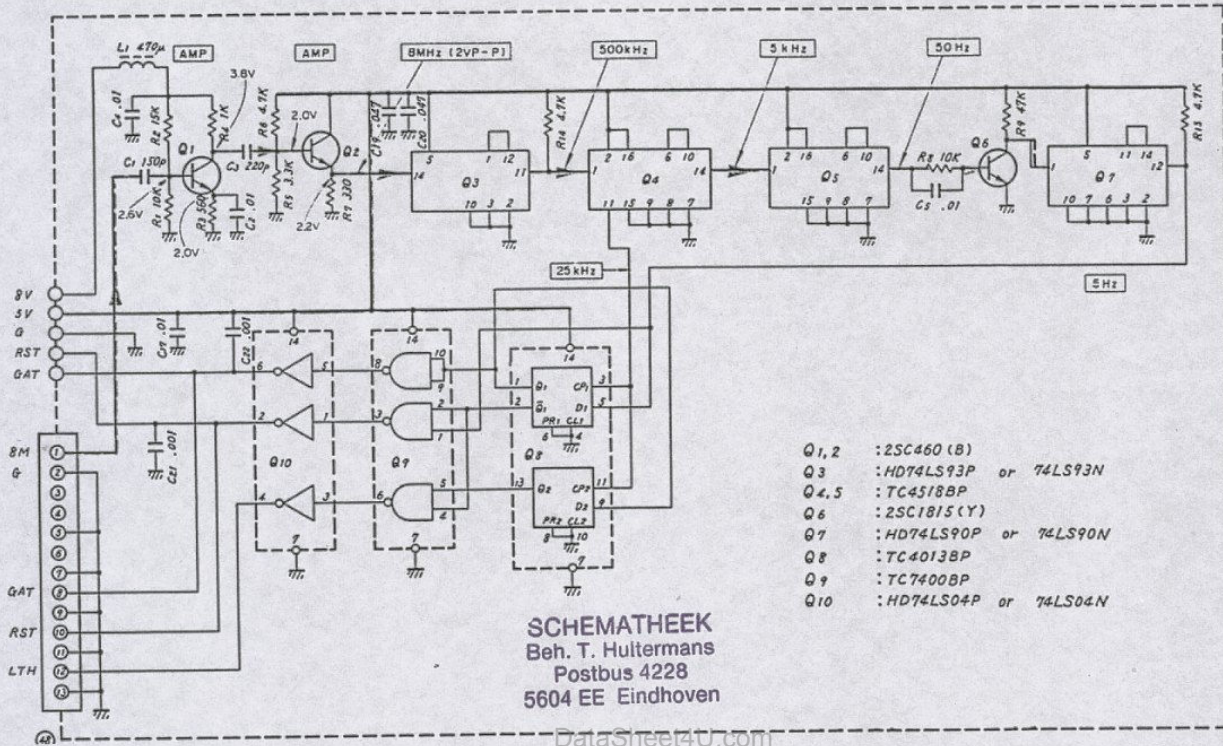
E

F

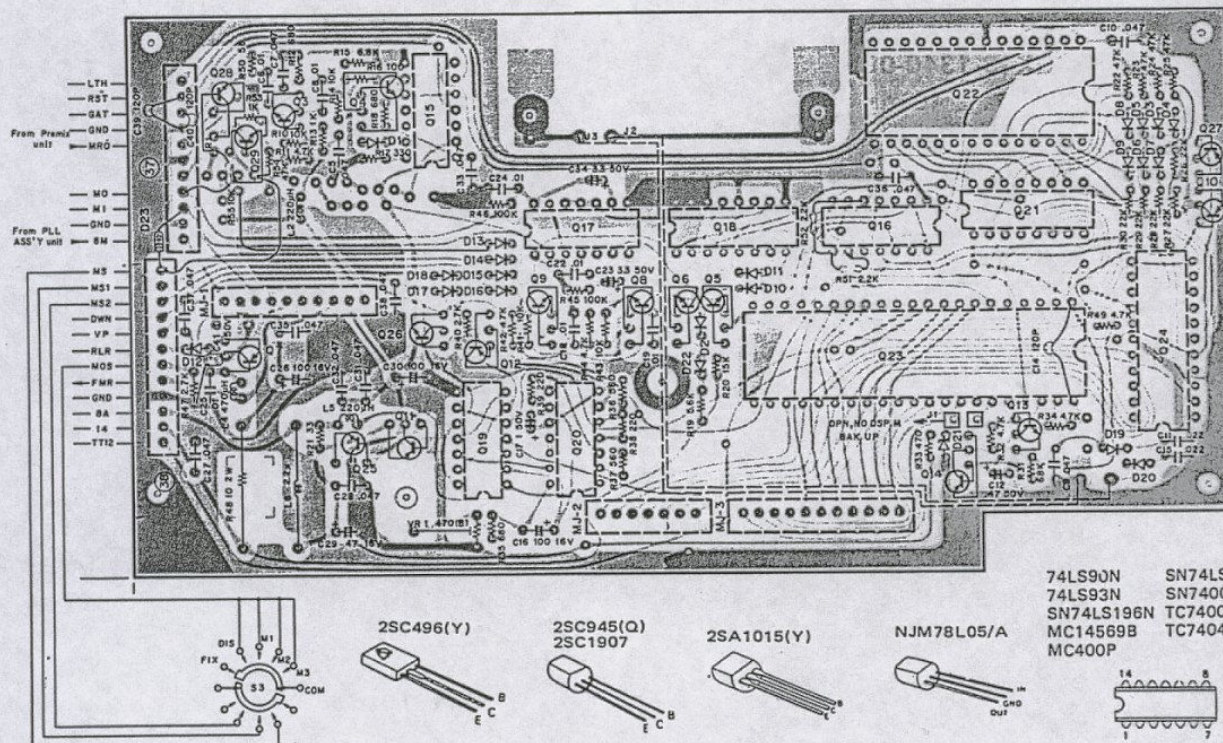
G

H

▼ COUNTER ASS'Y UNIT (X60-1100-00)
▼ DIVIDE UNIT (X54-1420-00)

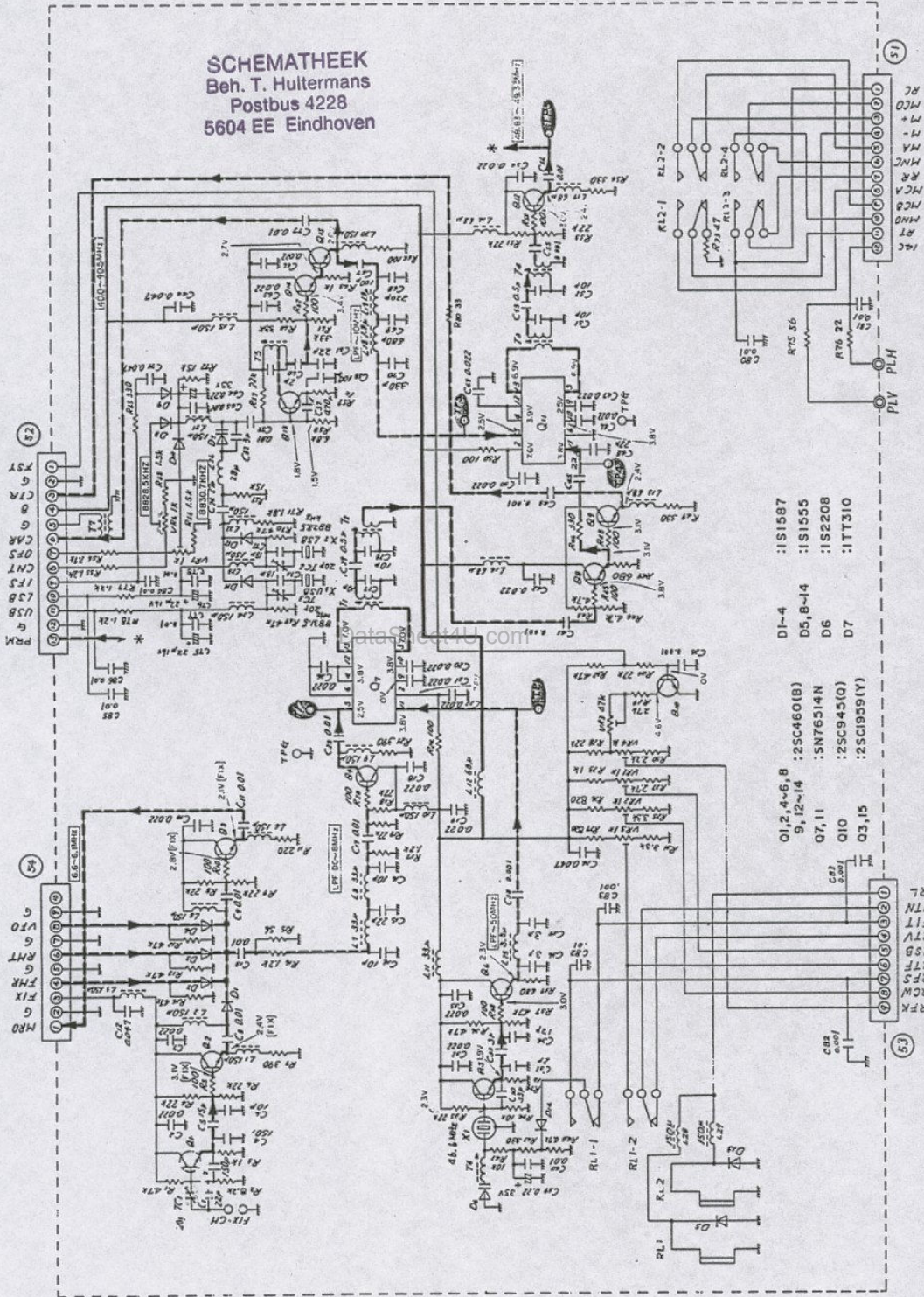


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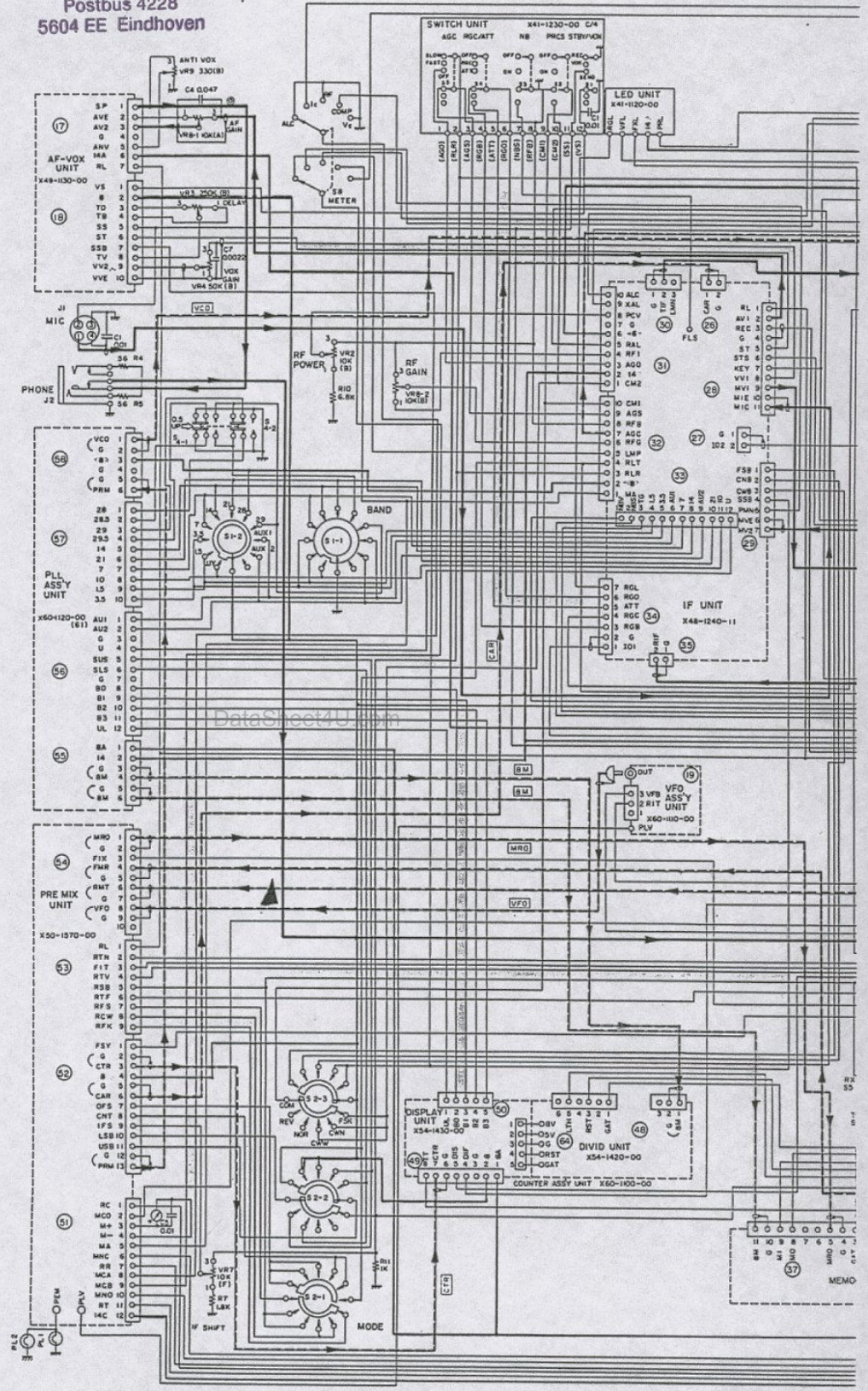


▼ PREMIX UNIT (X50-1570-00)

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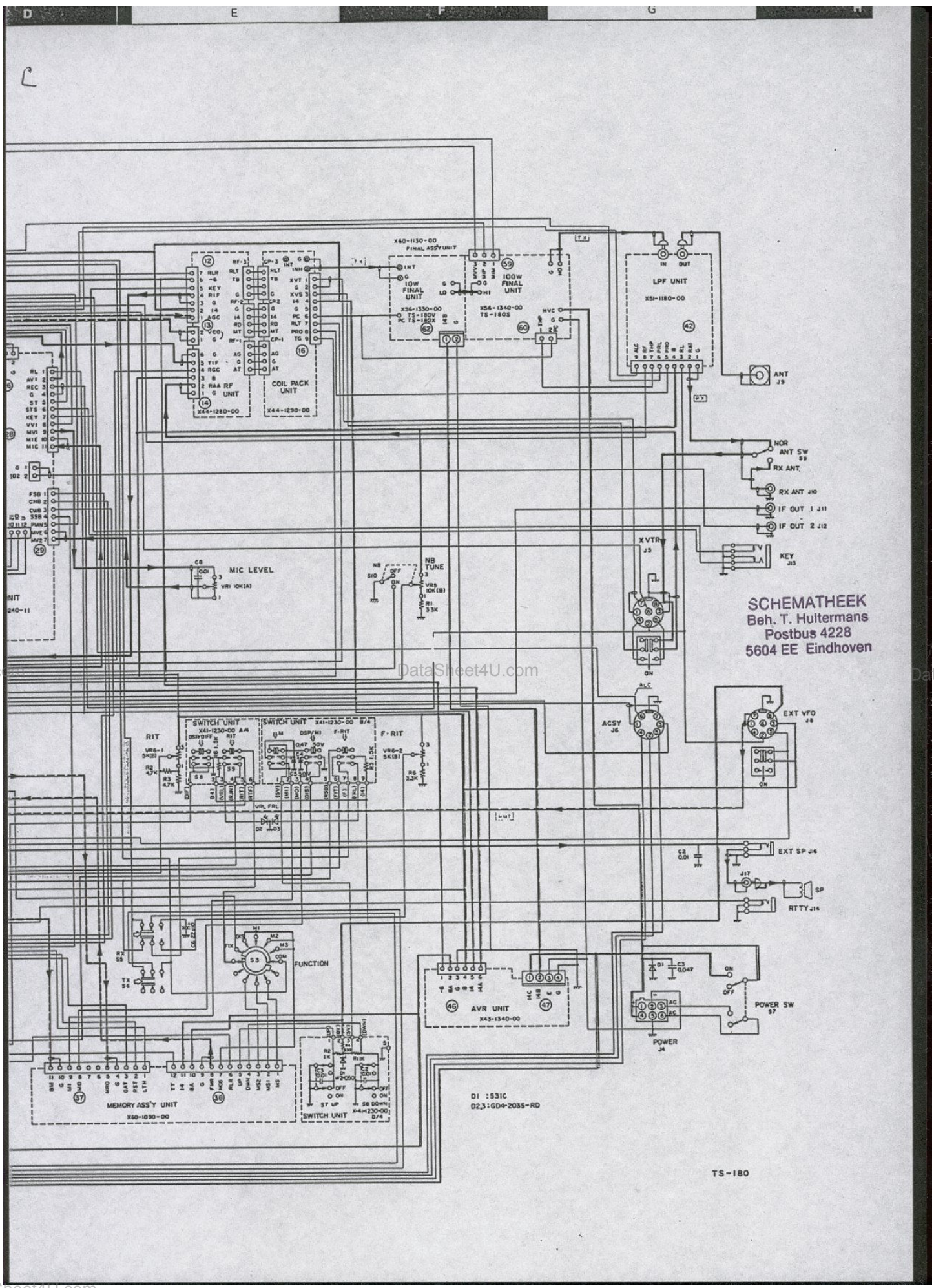
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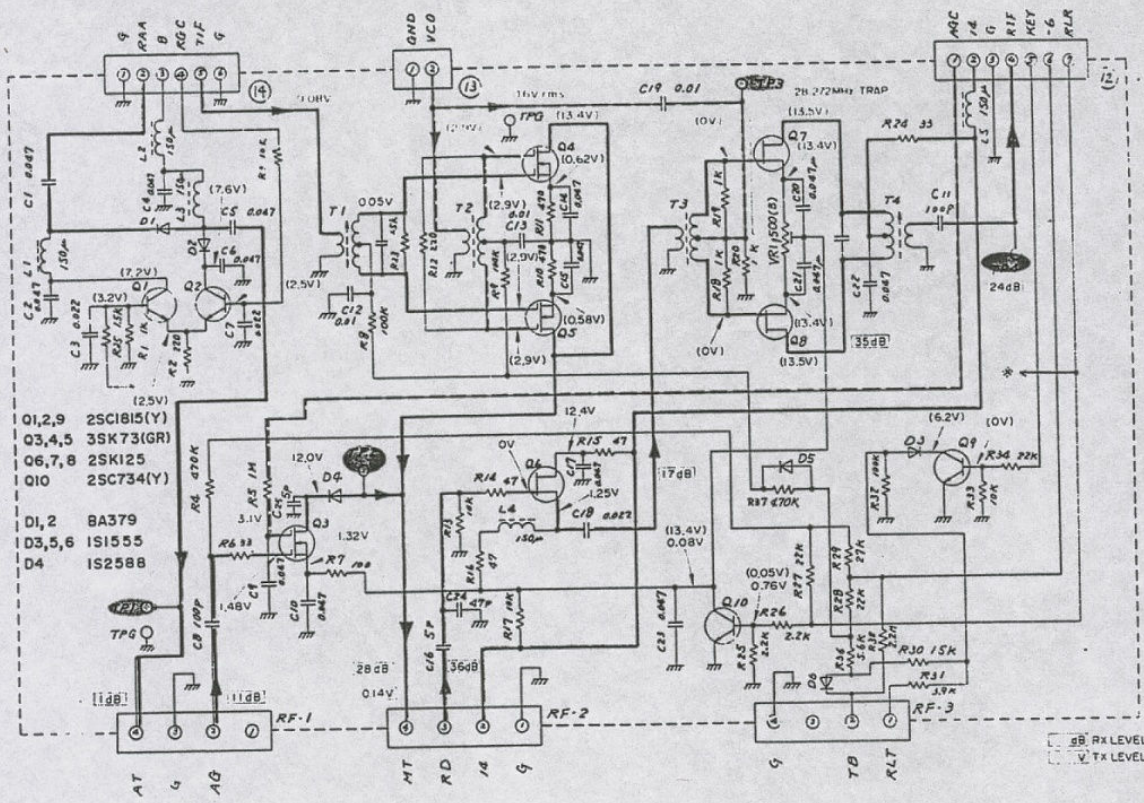
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▼ AVR UNIT (X43-1340-00) PARTS LIST: Page 40

