CHAPTER 97 — AVIONICS

CONTENTS — MAINTENANCE PROCEDURES

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AVIONICS

97-1. AVIONICS SYSTEMS.

Customer requirements vary so extensively that a basic avionics system is not provided. Various systems are available in Bell installed kits. These kits are installed when ordered by the customer. Intercommunications, navigation, communication, and identification functions are performed by the avionics equipment. Operational and maintenance procedures are available from the various equipment manufacturers.

Four basic systems exist: intercommunications, navigation, communication, and identification. Intercommunications system (ICS) equipment provides communication capability among helicopter crewmembers, and between crew and passengers. Navigation system equipment provides VHF omnidirectional range (VOR) and localizer (LOC) indications, and provides automatic direction finder (ADF) navigation indications. Communication system equipment provides two-way, VHF voice communications between helicopter and ground or other aircraft. Identification system equipment provides identification signals for air traffic control purposes.

97-2. CONFIGURATIONS.

Helicopter equipment configurations are dependent on the Bell systems kits installed or customized systems installed by other equipment manufacturers. Specific kit configurations and locations are provided in **figures 97-1** and **97-2**. Only available Bell kit configurations are covered within each system section.

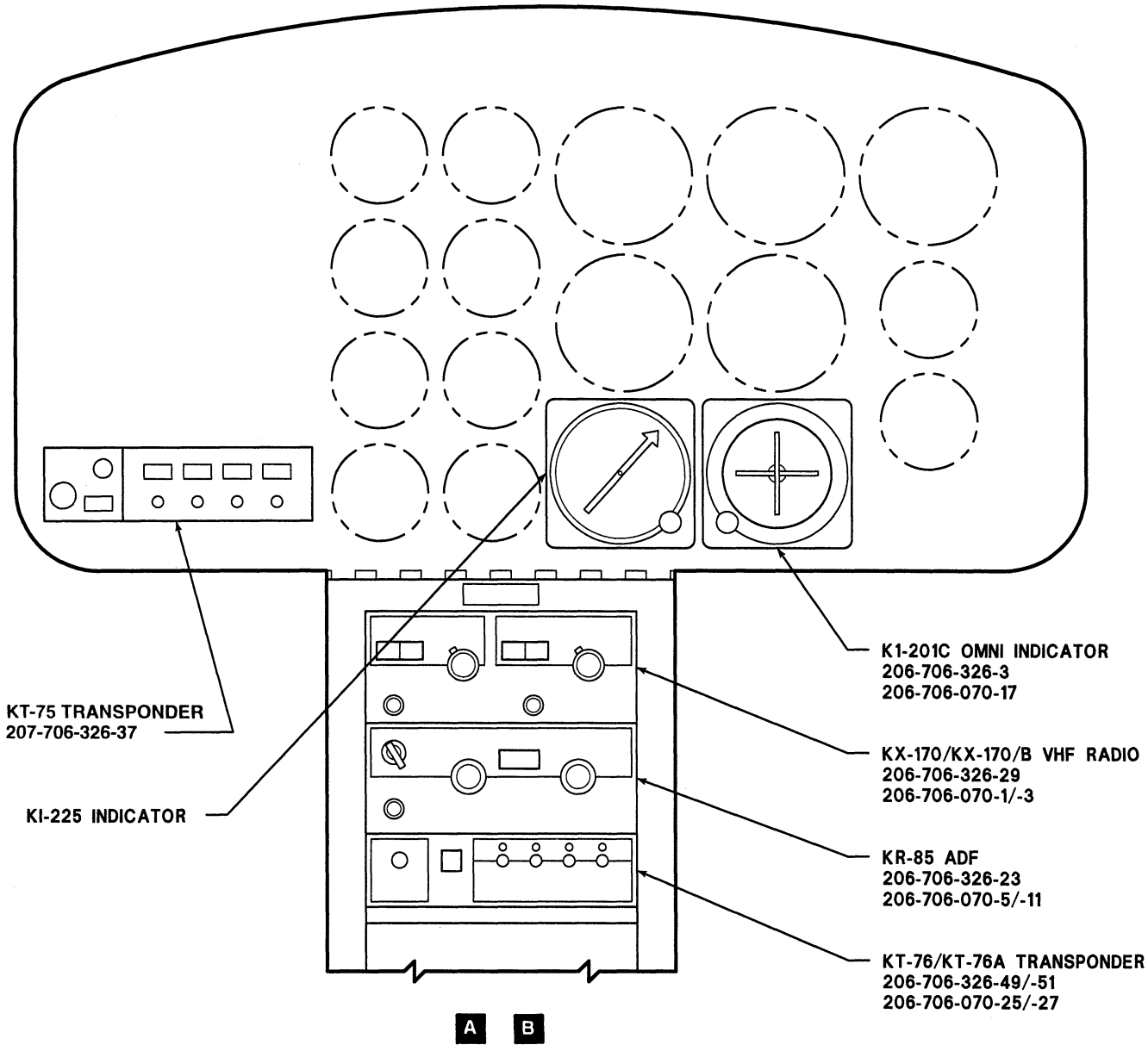
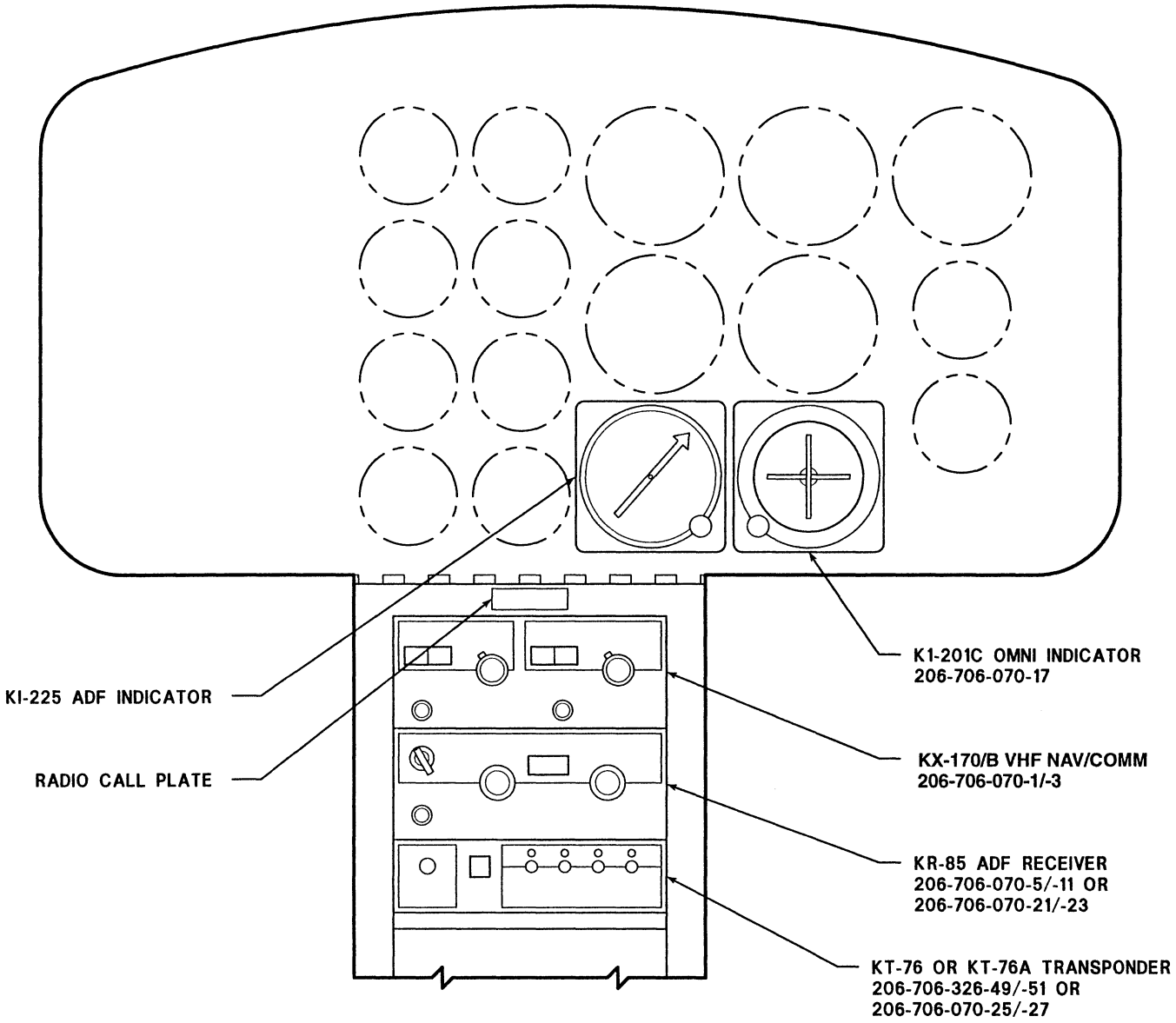


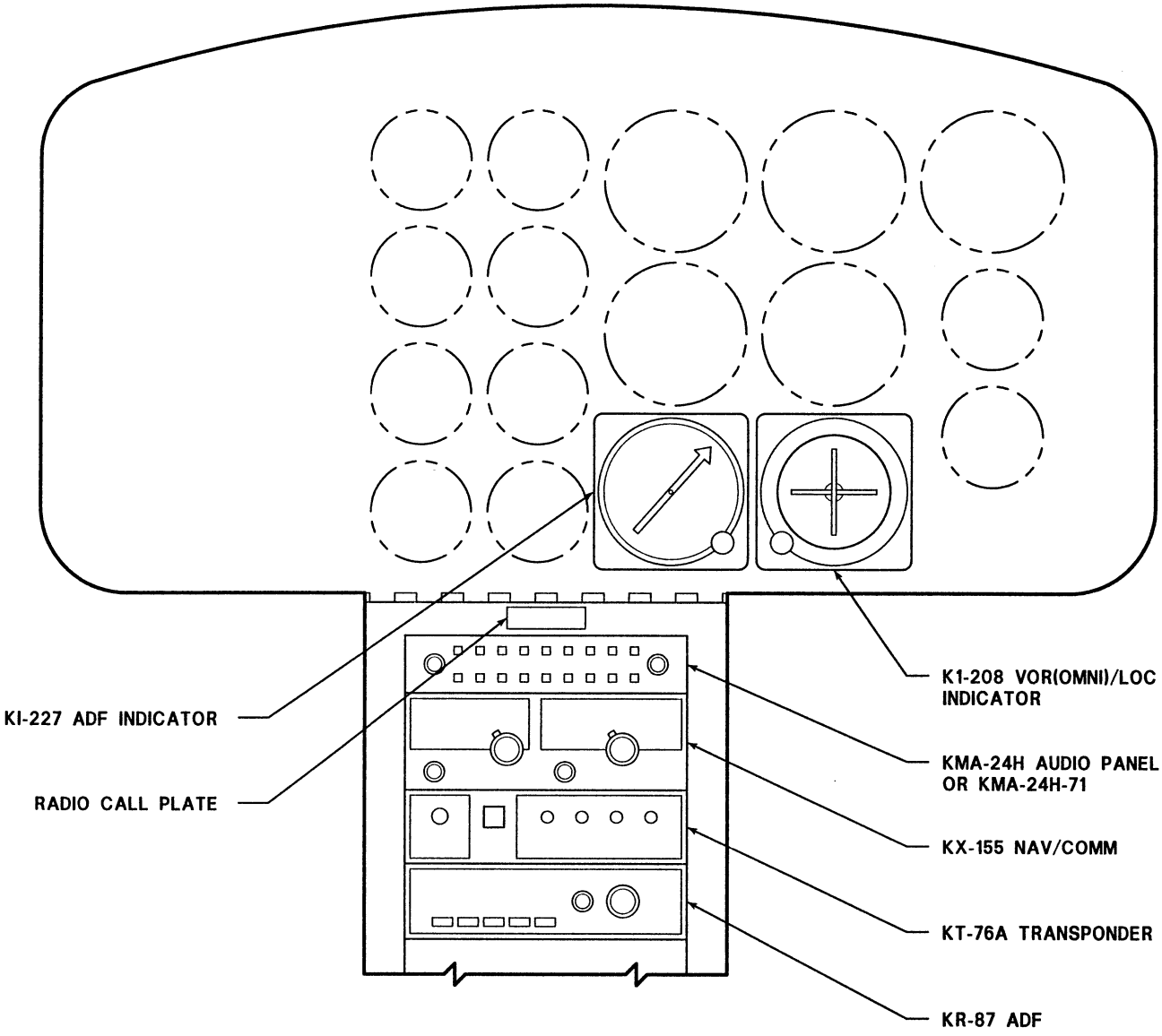
Figure 97-1. Avionics configurations (Sheet 1 of 3)



B3 S/N 2212 THRU S/N 3216

206A/BS-M-97-1-2

Figure 97-1. Avionics configurations (Sheet 2)



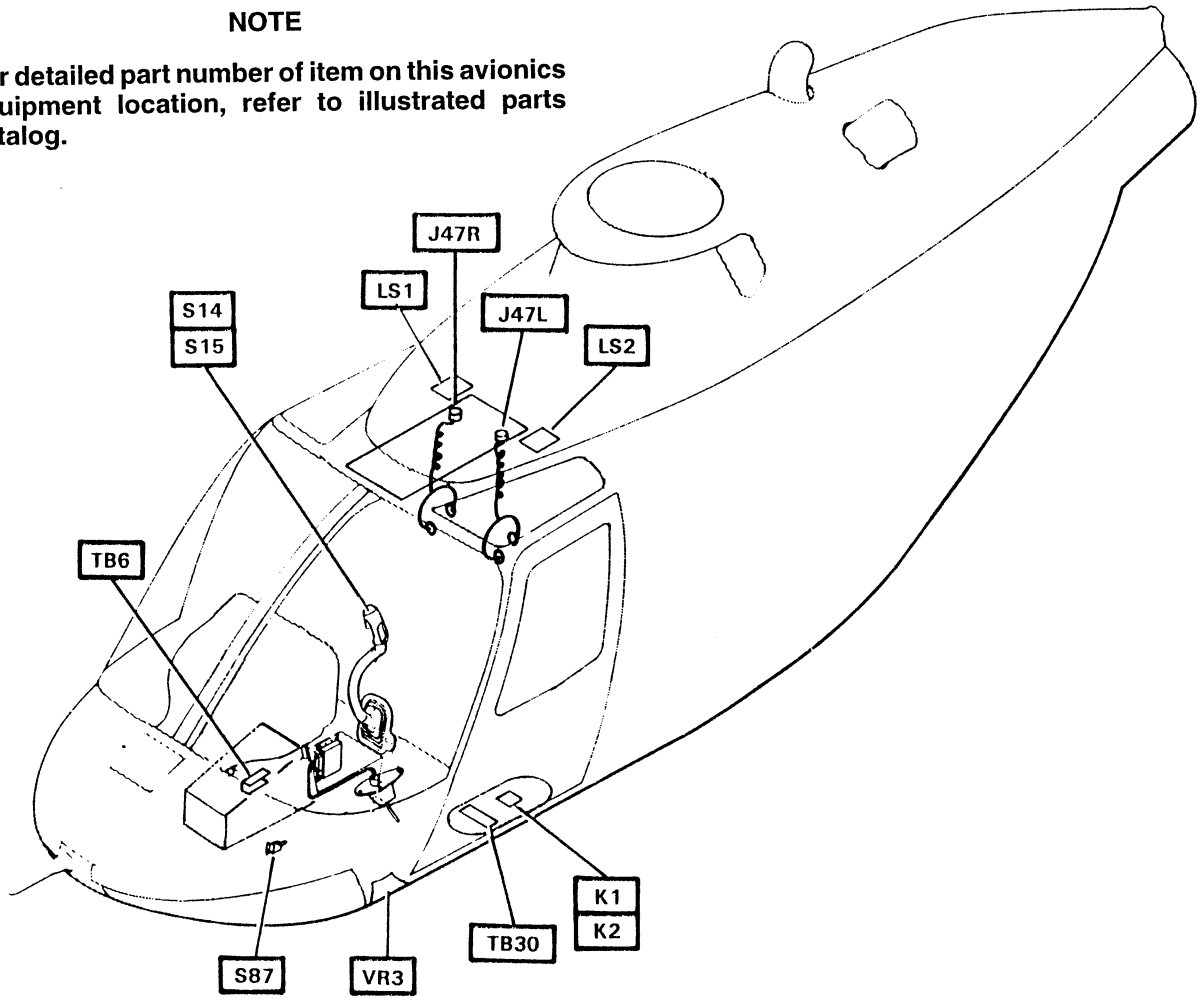
B3 S/N 3217 AND SUBSEQUENT

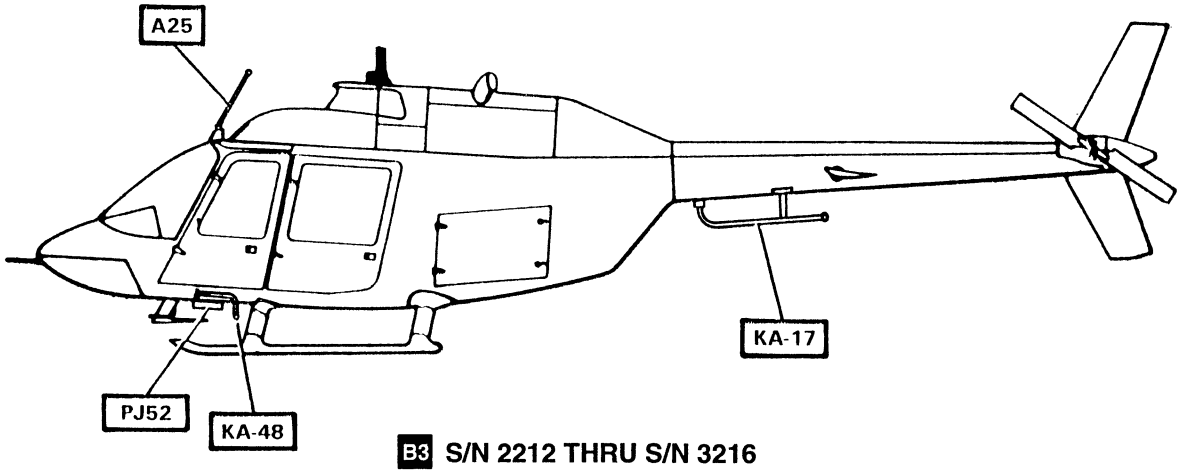
206A/BS-M-97-1-3

Figure 97-1. Avionics configurations (Sheet 3)

NOTE

For detailed part number of item on this avionics equipment location, refer to illustrated parts catalog.

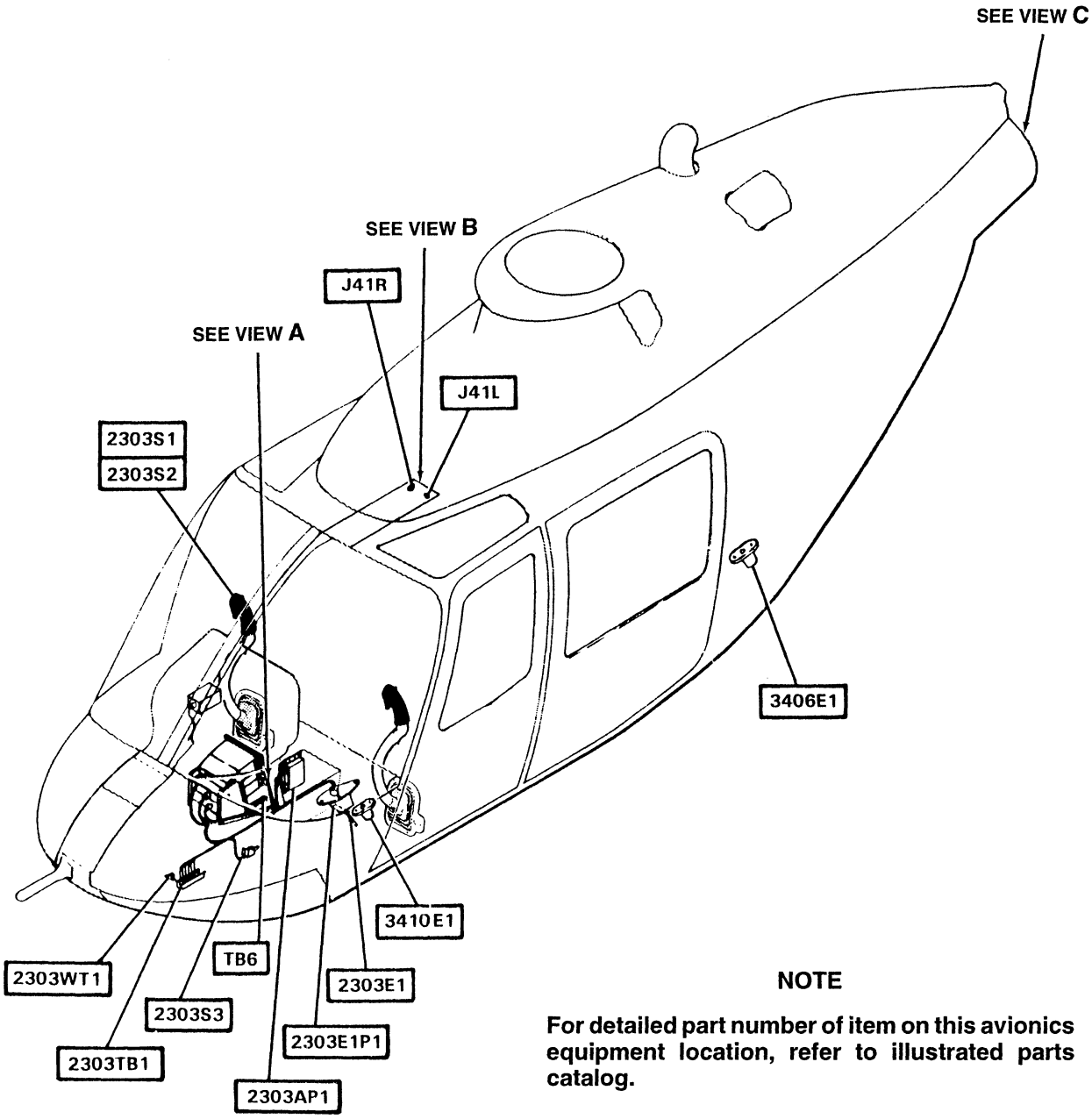




B3 S/N 2212 THRU S/N 3216

206A/BS-M-97-2-1

Figure 97-2. Avionics equipment locations (Sheet 1 of 3)



NOTE

For detailed part number of item on this avionics equipment location, refer to illustrated parts catalog.

B3 S/N 3217 AND SUBSEQUENT

206A/BS-M-97-2-2

Figure 97-2. Avionics equipment locations (Sheet 2)

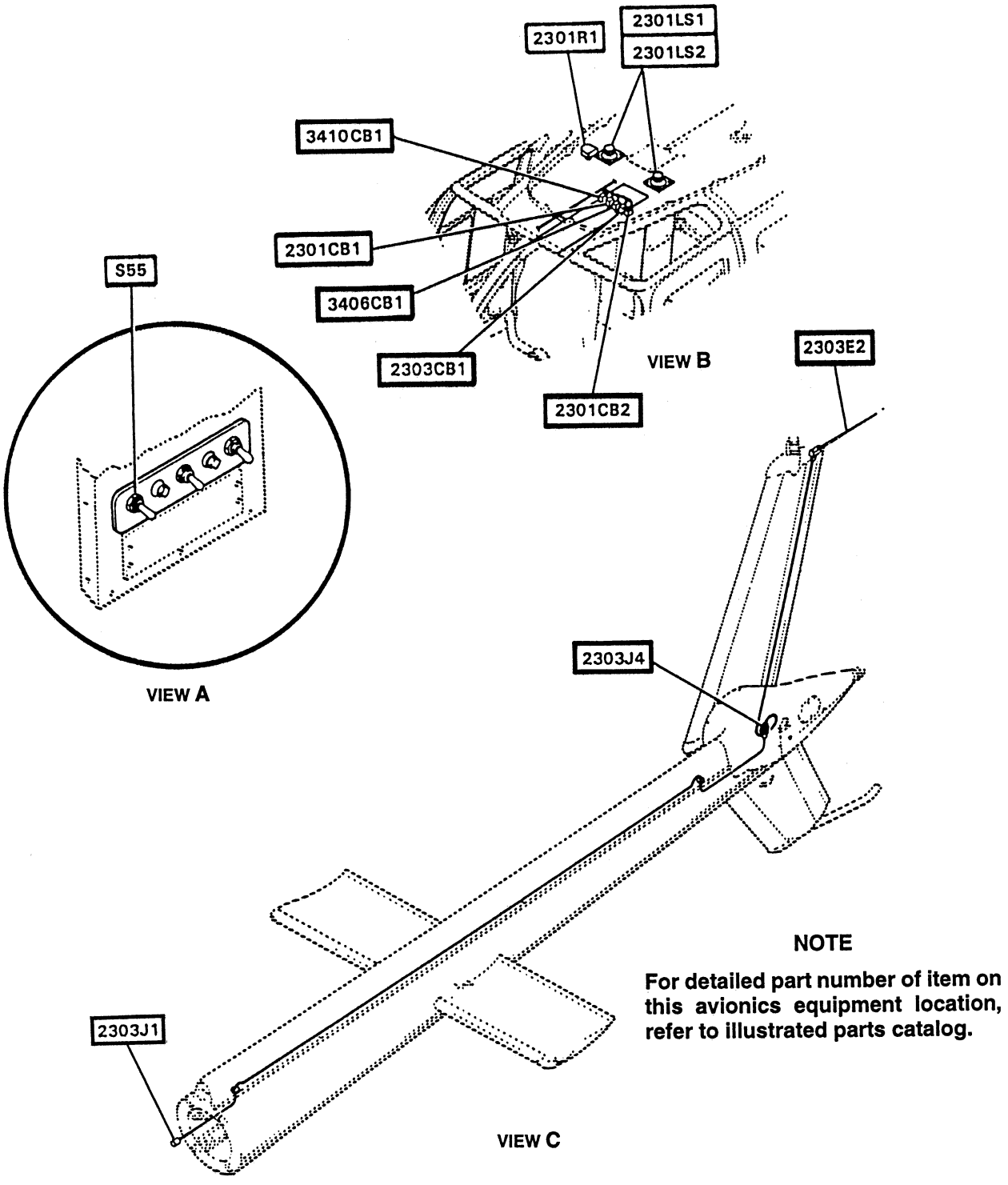


Figure 97-2. Avionics equipment locations (Sheet 3)

INTERCOMMUNICATIONS (ICS) SYSTEM

97-3. ICS SYSTEM.

Intercommunications system (ICS) equipment provide communications capability among crewmembers and between crew and passengers. Additionally, ICS equipment provides audio signal control for all avionics systems. Audio outputs to pilot/copilot headsets and cabin speakers are controlled by an audio panel, if installed, or by avionics equipment volume controls. When not equipped with an audio panel, audio-signal switching is provided by internal relays within helicopter ICS circuitry. Headset and hand-held microphones are keyed for ICS communication by depressing cyclic-stick grip switches to the ICS position, or by depressing the copilot ICS foot switch. ICS system components and circuitry provisions are available in kits for installation. ICS components include the KX-170 and KX-170B transceivers or the KMA-24H-52 and KMA-24H-71 audio panels. Internal relays are installed for use with the KX-170 and KX-170B VHF transceivers to provide audio signal switching control.

97-4. OPERATIONAL CHECKS AND TROUBLESHOOTING — ICS.

Refer to applicable wiring diagrams and troubleshooting charts in this chapter and to applicable equipment manufacturer maintenance manuals for operational checks and troubleshooting procedures.

COMMUNICATION SYSTEM

97-5. VHF COMMUNICATION SYSTEM.

Two-way voice communications are available on 720 channels at frequencies ranging from 118.000 to 135.975 MHz. VHF transceivers available in kits include the KX-170/KX-170B and KX-155. Both transceivers are dual function providing VHF navigation capabilities as well as voice communications (refer to Navigation Systems). On the KX-155 transceiver front panel, two communications frequencies are displayed on the far left side: one active and one standby.

97-6. OPERATIONAL CHECKS AND TROUBLESHOOTING — VHF COMM.

Refer to applicable wiring diagrams and troubleshooting charts in this chapter and to applicable equipment manufacturer maintenance manuals for operational checks and troubleshooting prodecures.

VHF NAVIGATION SYSTEM

97-7. VHF NAVIGATION SYSTEM.

VHF navigation capability provides VHF omnidirectional range (VOR) and localizer (LOC) information to the pilot and copilot. Two VHF transceivers are available in avionics kits: the KX-170/KX-170B and the KX-155. These transceivers are dual purpose providing two-way voice communications as well as navigation capability. Both transceivers provide 200 navigation channels at frequencies ranging from 108.00 to 117.95 MHz.

If the KX-170 or KX-170B VHF transceiver is installed, the KI-201C indicator is used to display VOR/LOC information. If the KX-155 transceiver is installed, the KI-208 indicator is used to display course deviation information. On the KX-155 transceiver front panel, two navigation frequencies are displayed on the far right side: one active and one standby.

97-8. OPERATIONAL CHECK AND TROUBLESHOOTING — VHF NAV.

Refer to applicable wiring diagrams and troubleshooting charts in this chapter and to applicable equipment manufacturer maintenance manuals for operational checks and troubleshooting procedures.

AUTOMATIC DIRECTION FINDER (ADF) NAVIGATION SYSTEM

97-9. ADF NAVIGATION.

ADF navigation capability provides relative bearing to the selected transmitting station which allows distance-to-station calculations to be made. Available kits provide two ADF receivers: the KR-85 and KR-87. These receivers operate in a frequency range from 200 to 1699 KHz in 1.0 KHz steps. ADF frequency, antenna, and beat frequency oscillator modes are the three ADF receiver operational modes. If the KR-85 ADF receiver is installed, the KI-225 ADF indicator is used to display bearing indications. If the KR-87 ADF receiver is installed, the KI-227 ADF indicator is used to display bearing indications.

97-10. OPERATIONAL CHECK AND TROUBLESHOOTING — ADF NAV.

Refer to applicable wiring diagrams and troubleshooting charts in this chapter and to applicable equipment manufacturer maintenance manuals for operational checks and troubleshooting procedures.

IDENTIFICATION SYSTEM

97-11. IDENTIFICATION SYSTEM.

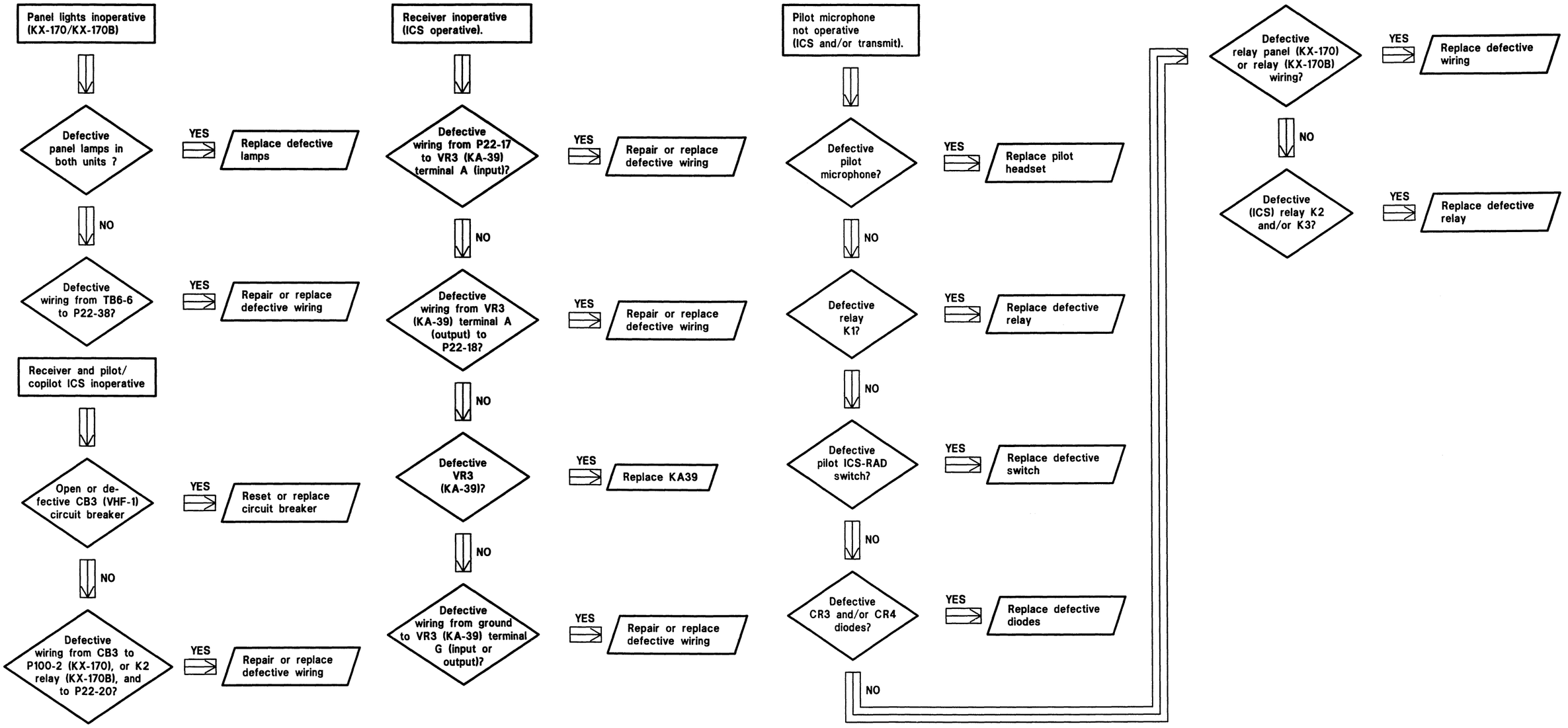
Identification system transponders are designed to fulfill Air Traffic Control Radar Beacon System (ATCRBS) requirements for an airborne beacon. Three transponders are provided for installation in available avionics kits: the KT-75R and the KT-76/76A and KT-79. A KFS-575 control unit is utilized by the KT-75R transponder. These transponders receive interrogation signals from ground radar at 1030 MHz. A coded response is automatically generated to the ground receiving station at 1090 MHz. Specific pulse sequences for 4096 preselected codes are assigned to helicopters or reserved for specific occasions. These codes enable the air traffic controller to accurately and quickly identify the helicopter. To further assist with rapid identification, the air traffic controller may request the pilot to identify the helicopter. This is accomplished by depressing the IDENT switch on the transponder panel which causes the ATC radar display blip to flash or "bloom".

NOTE

FAA designated codes shall only be used for the specific purpose identified:
0000 and 7777 — never used;
1200 — VFR below 10,000 feet;
1400 — VFR above 10,000 feet;
4000 — restricted or warning area;
7500 — hijacking;
7600 — lost communications; and
7700 — inflight emergency (MAYDAY).

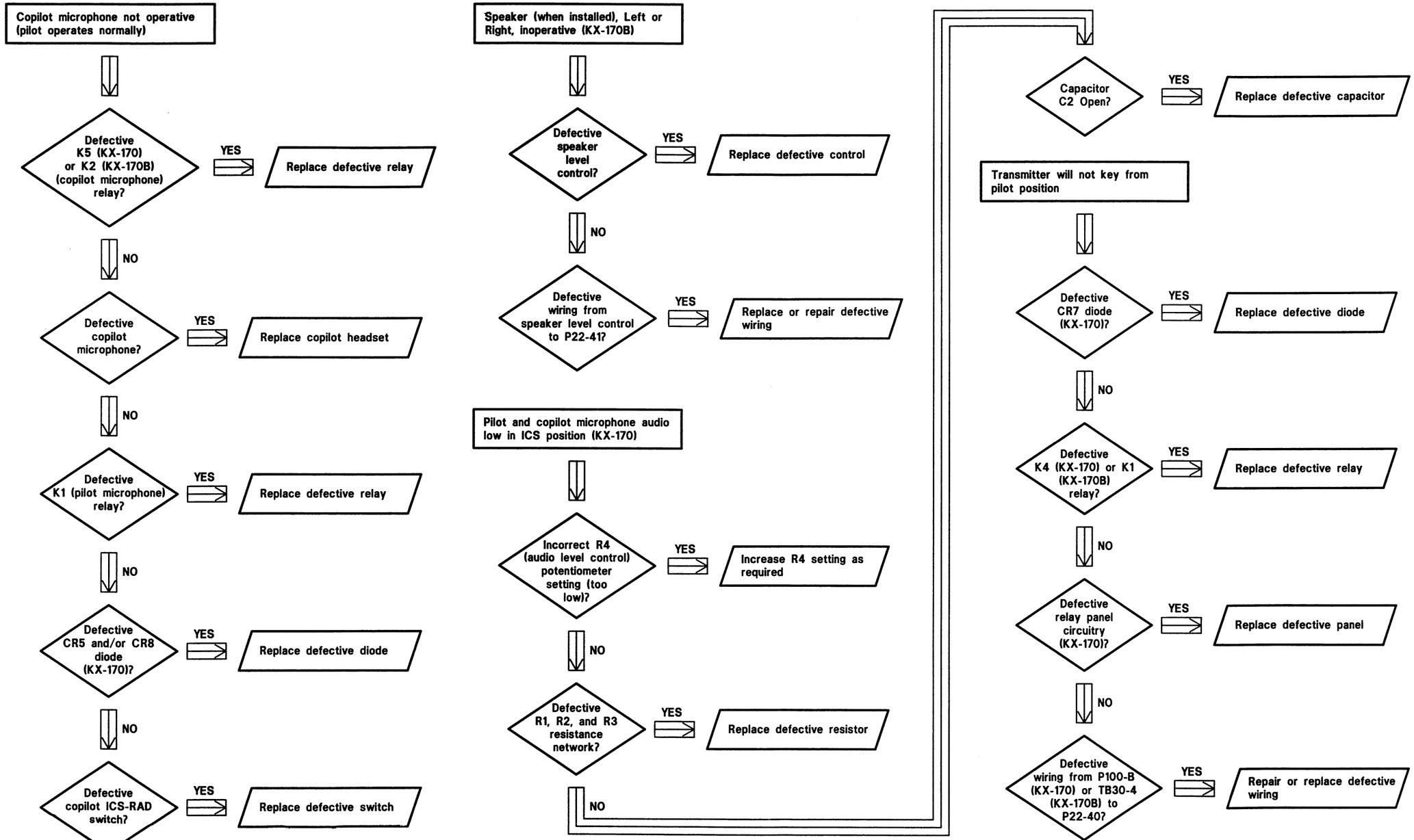
97-12. OPERATIONAL CHECK AND TROUBLESHOOTING — ID SYSTEM.

Refer to applicable wiring diagrams and troubleshooting charts in this chapter and to applicable equipment manufacturer maintenance manuals for operational checks and troubleshooting procedures.



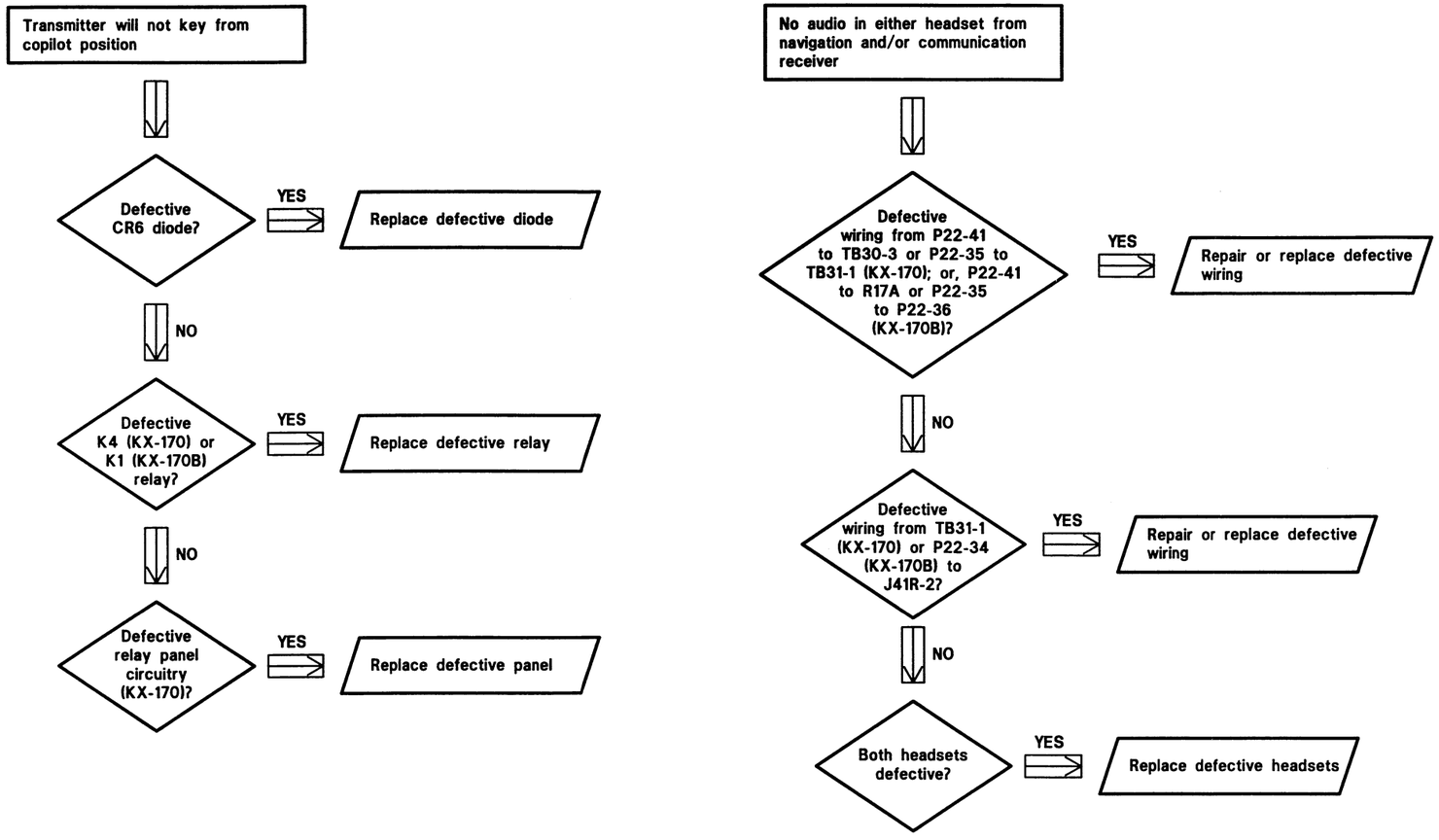
206A/BS-M-97-3-1

Figure 97-3. VHF COMM/NAV/ICS (KX-170/KX-170B) — troubleshooting charts (Sheet 1 of 3)



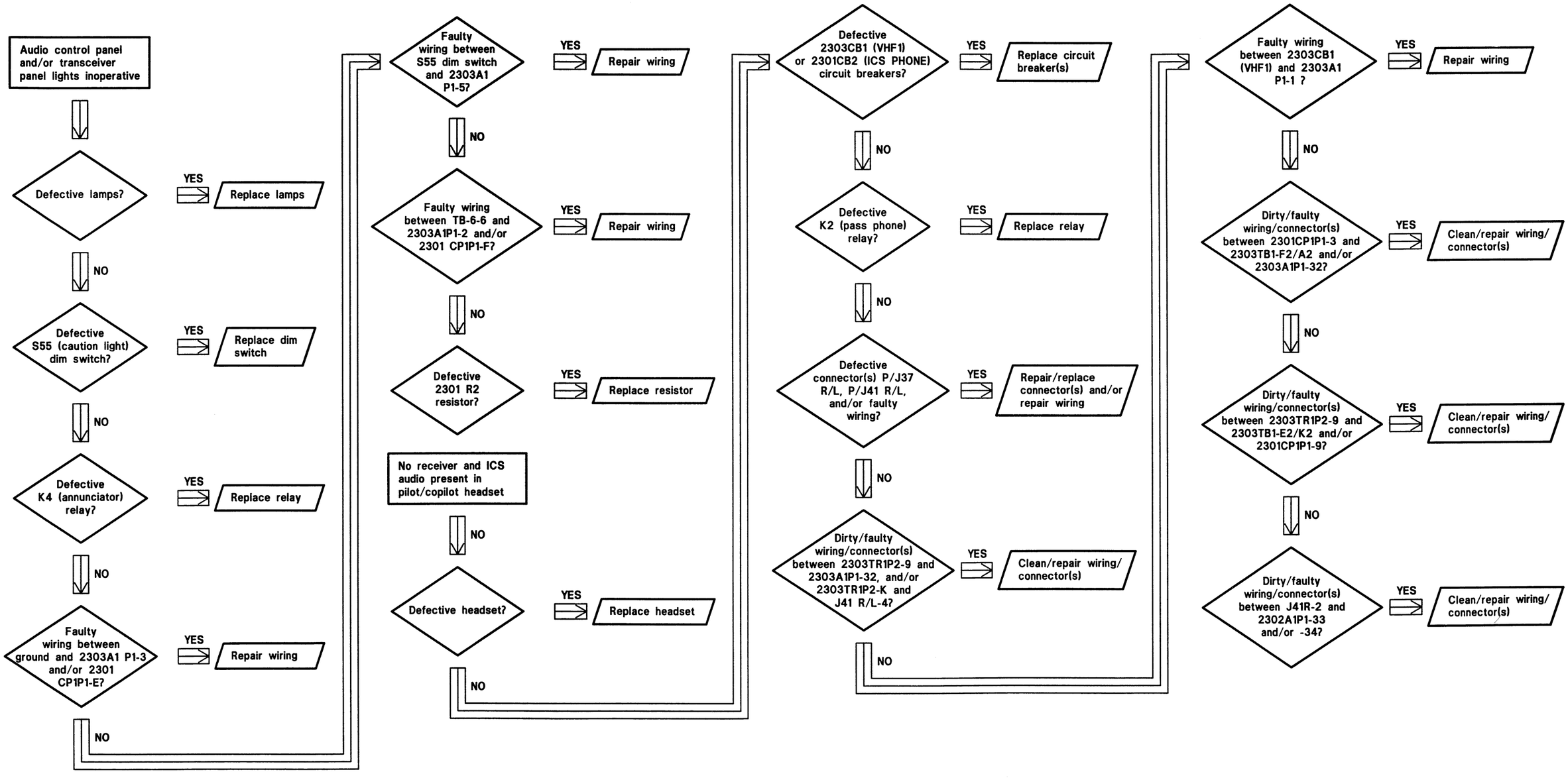
206A/BS-M-97-3-2

Figure 97-3. VHF COMM/NAV/ICS (KX-170/KX-170B) — troubleshooting charts (Sheet 2)



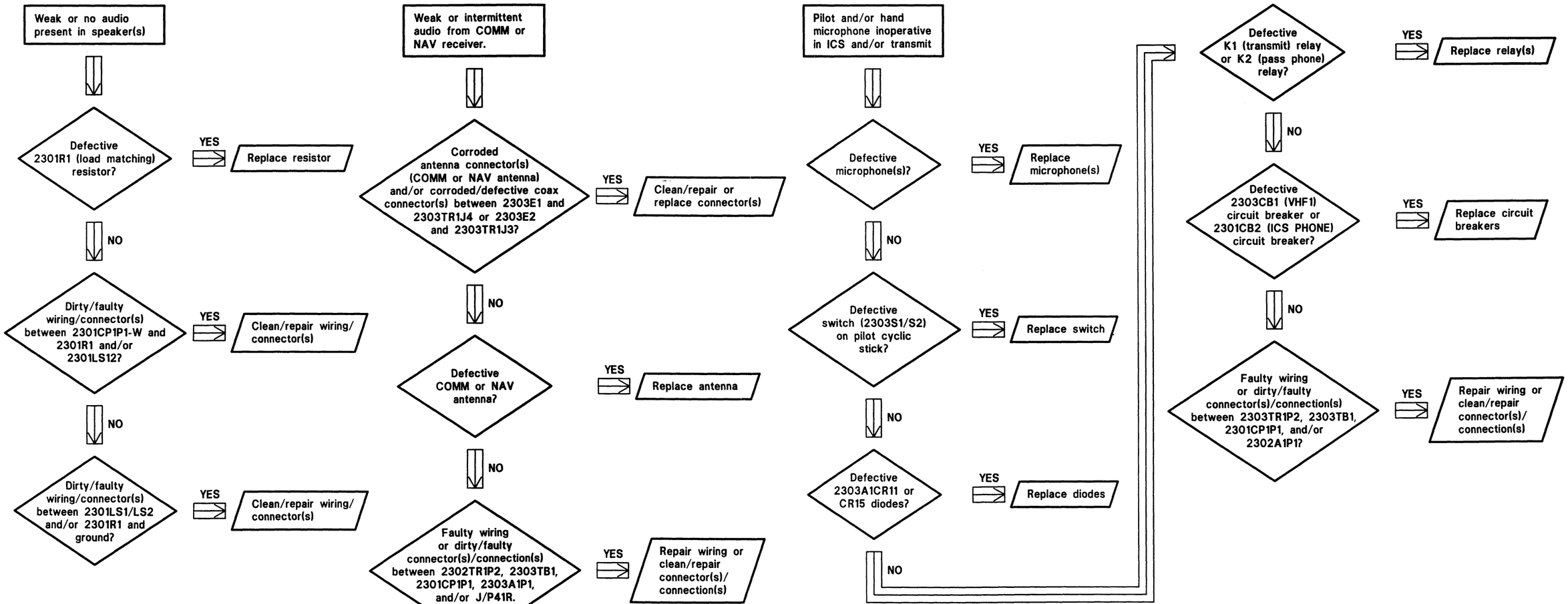
206A/BS-M-97-3-3

Figure 97-3. VHF COMM/NAV/ICS (KX-170/KX-170B) — troubleshooting charts (Sheet 3)



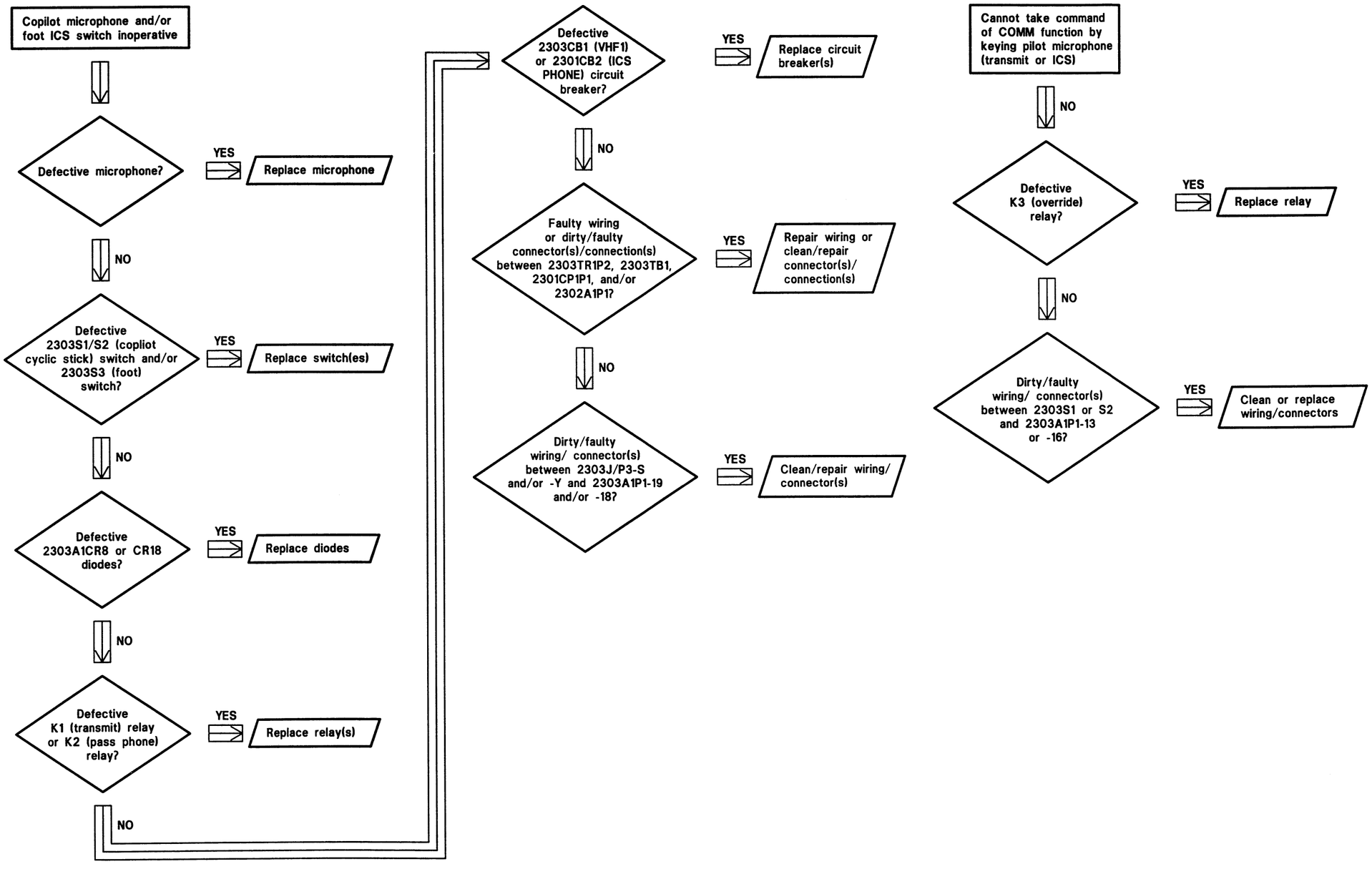
206A/BS-M-97-4-1

Figure 97-4. VHF COMM/NAV/ICS (KX-155 with KMA-24H or KMA-24H-71) — troubleshooting charts (Sheet 1 of 3)



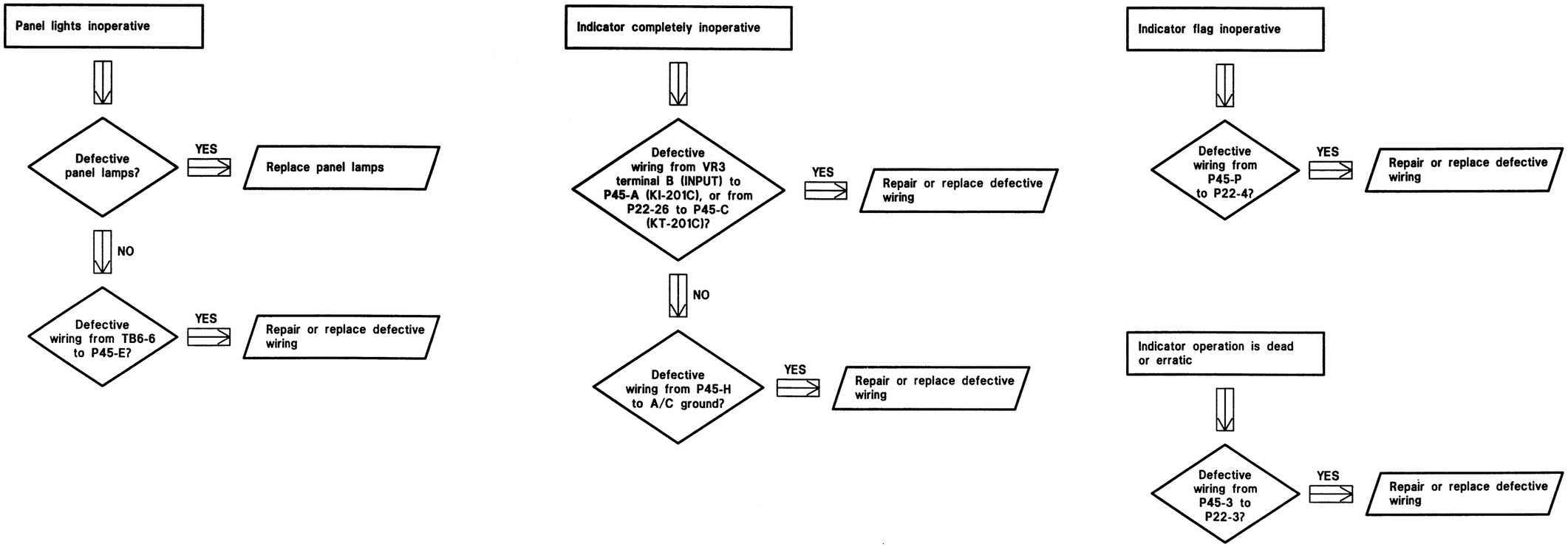
206A/BS-M-97-4-2

Figure 97-4. VHF COMM/NAV/ICS (KX-155 with KMA-24H or KMA-24H-71) — troubleshooting charts (Sheet 2)



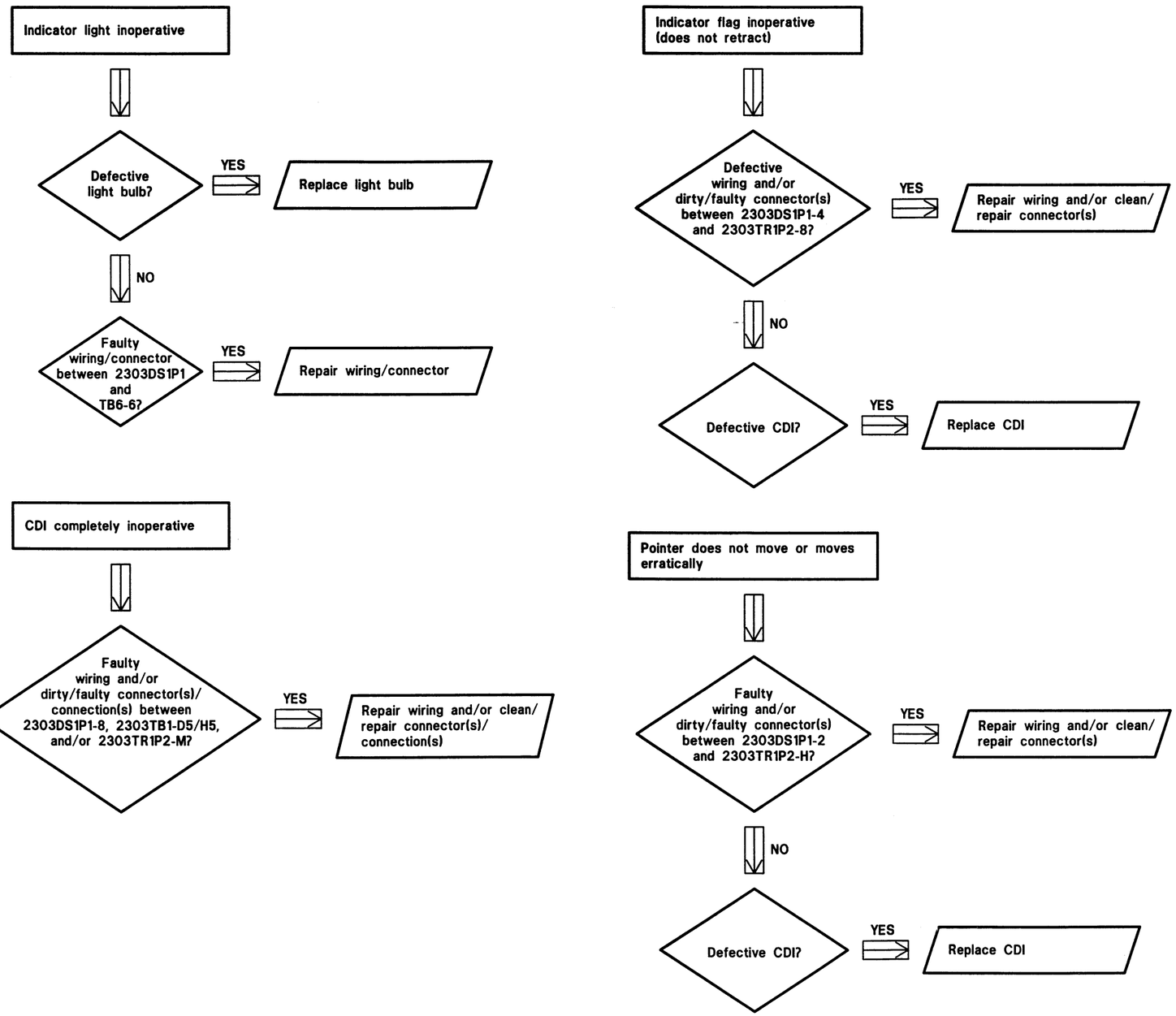
206A/BS-M-97-4-3

Figure 97-4. VHF COMM/NAV/ICS (KX-155 with KMA-24H or KMA-24H-71) — troubleshooting charts (Sheet 3)



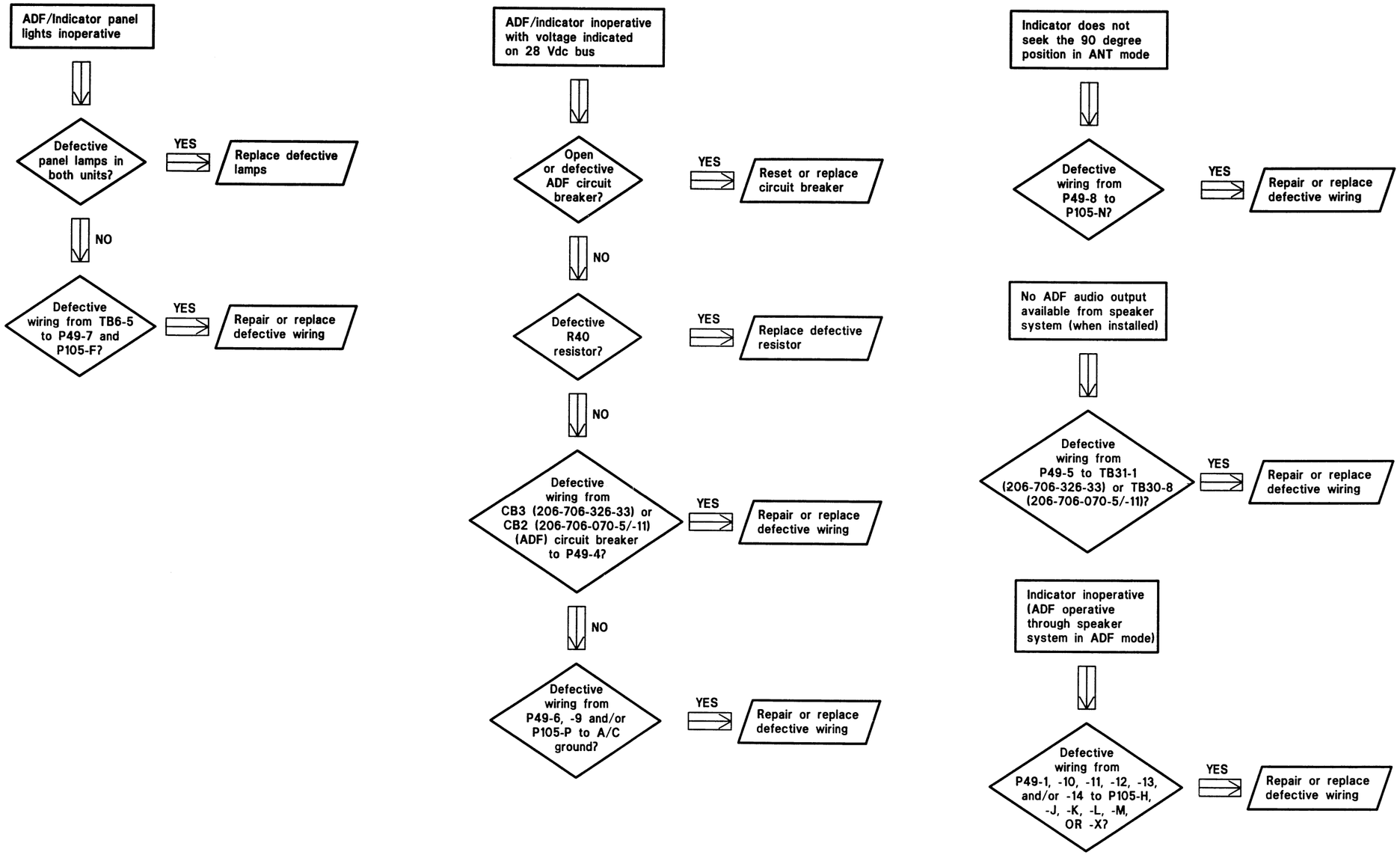
206A/BS-M-97-5

Figure 97-5. OMNI (KI-201C) — troubleshooting charts



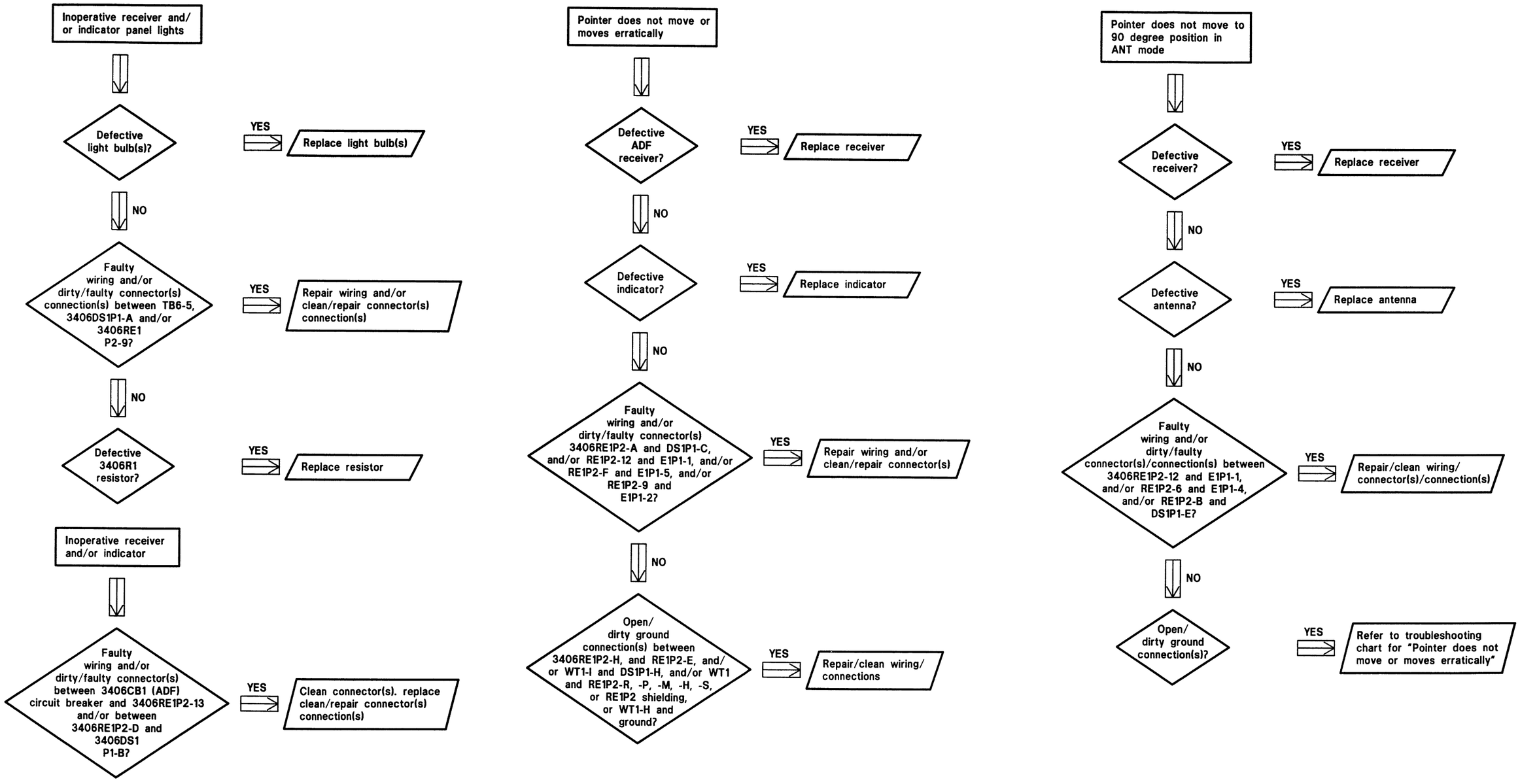
206A/BS-M-97-6

Figure 97-6. OMNI (KI-208) — troubleshooting charts



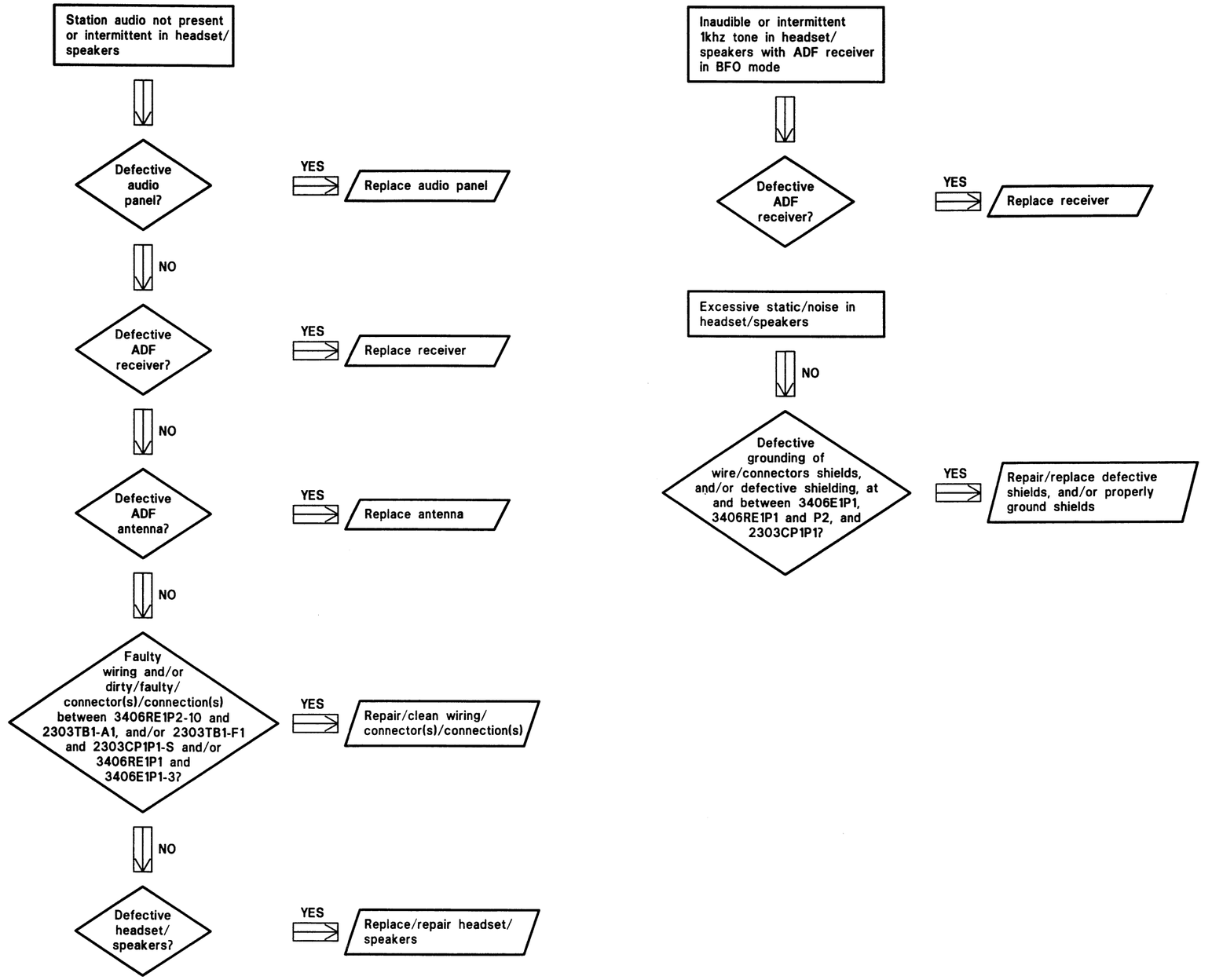
206A/BS-M-97-7

Figure 97-7. ADF (KR-85 and KI-225) — troubleshooting charts



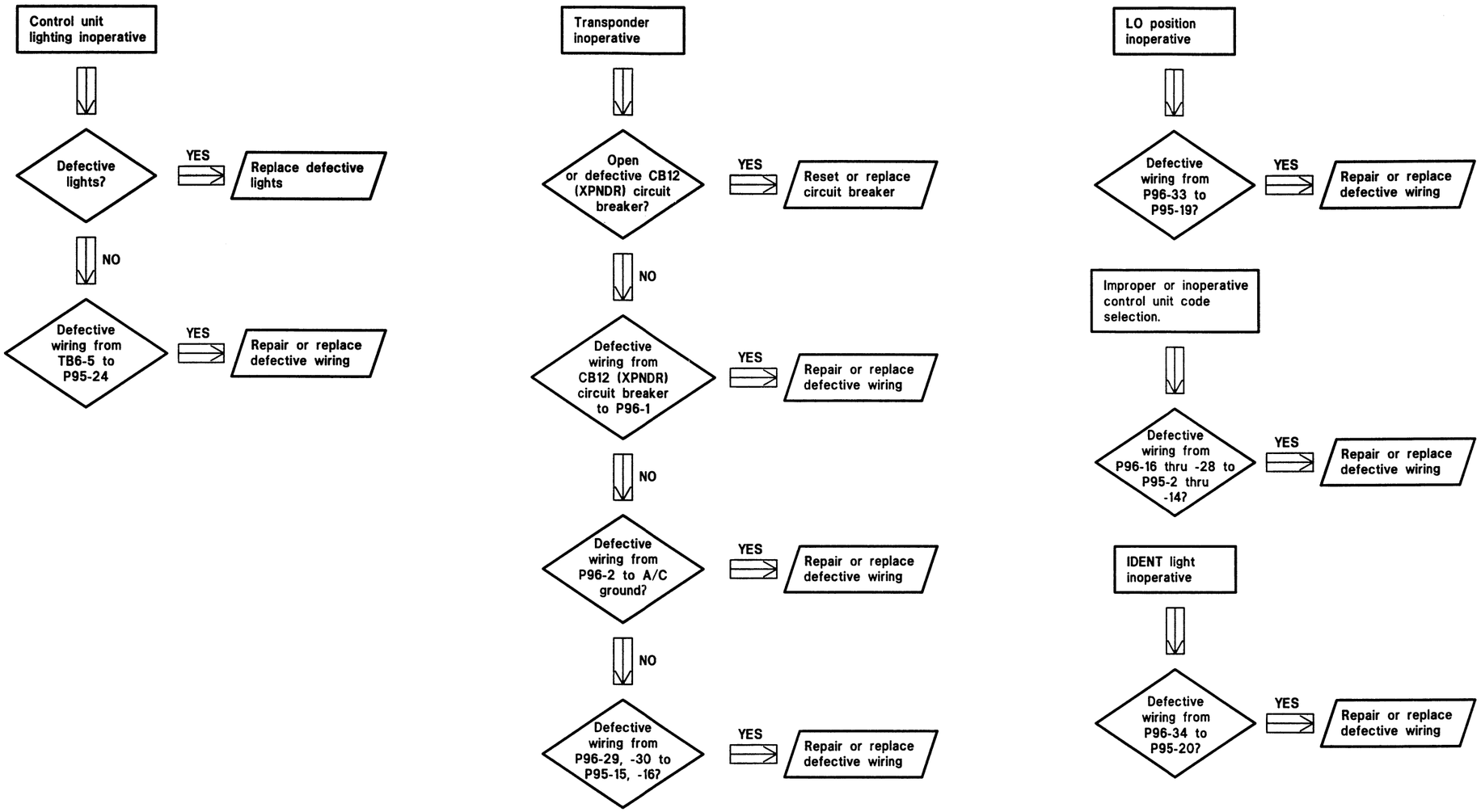
206A/BS-M-97-8-1

Figure 97-8. ADF (KR-87 with KI-227 and KA-44B) — troubleshooting charts (Sheet 1 of 2)



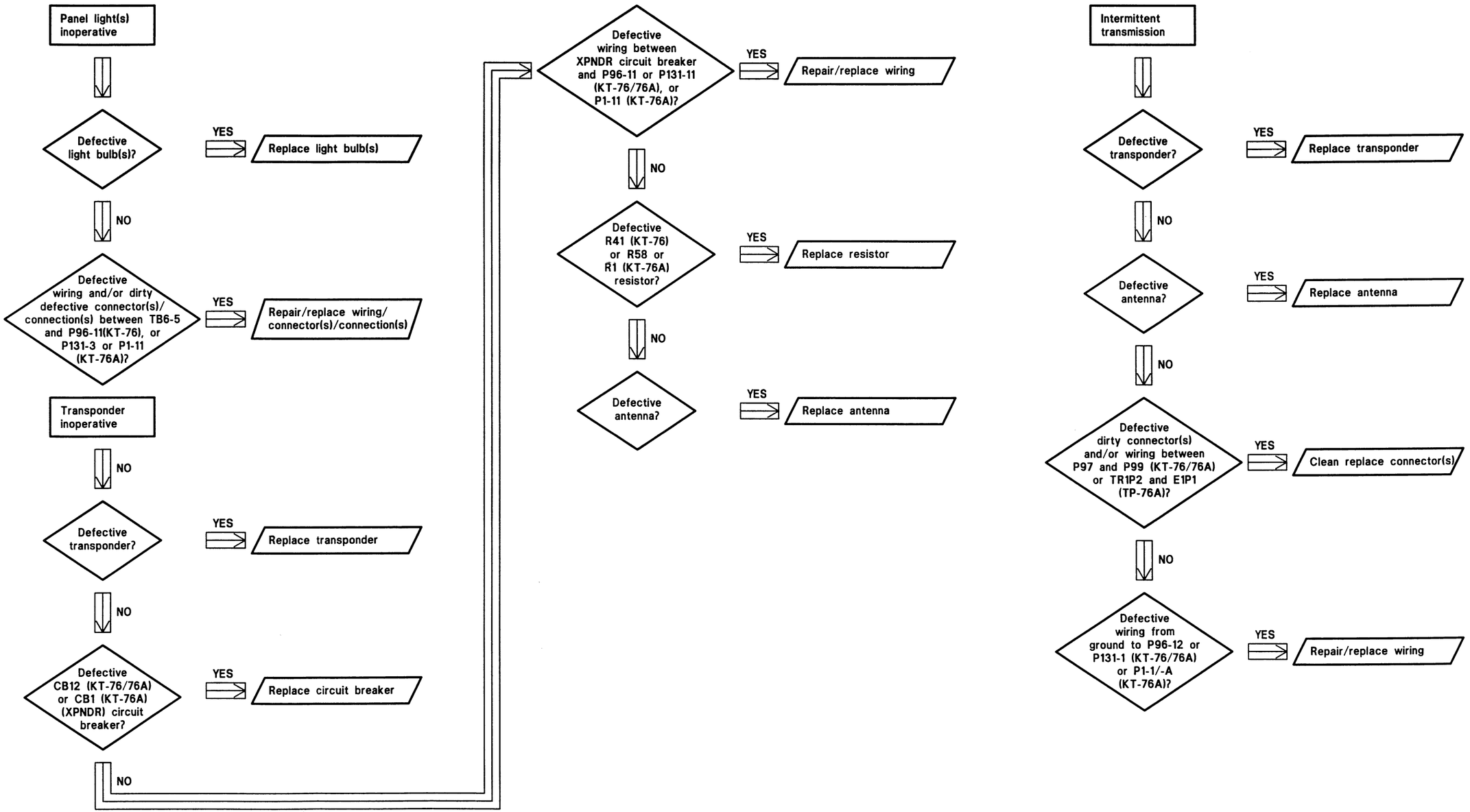
206A/BS-M-97-8-2

Figure 97-8. ADF (KR-87 with KI-227 and KA-44B) — troubleshooting charts (Sheet 2)



206A/BS-M-97-9

Figure 97-9. Transponder (KT-75R with KFS-575) — troubleshooting charts



206A/BS-M-97-10

Figure 97-10. Transponder (KT-76/KT-76A) — troubleshooting chart

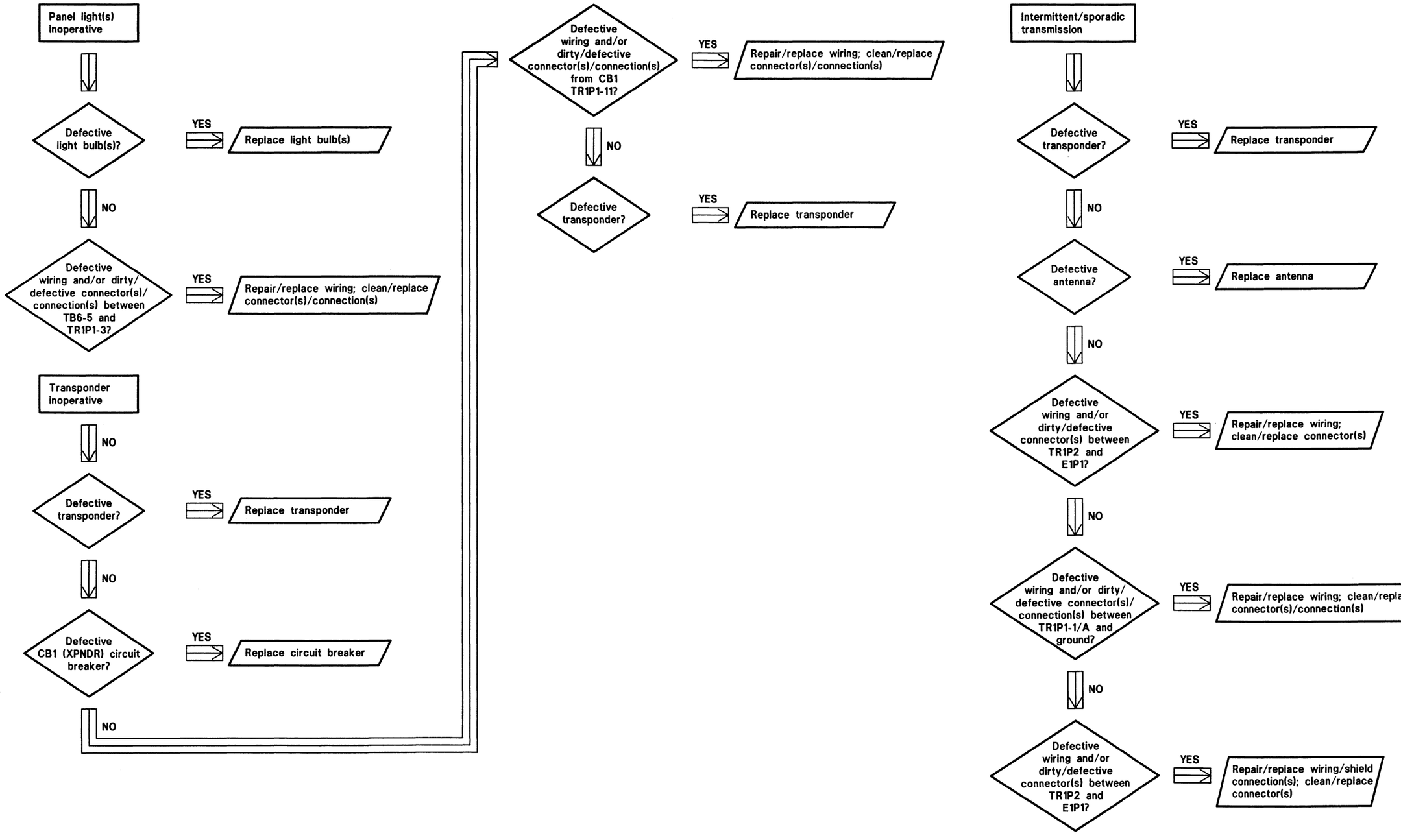
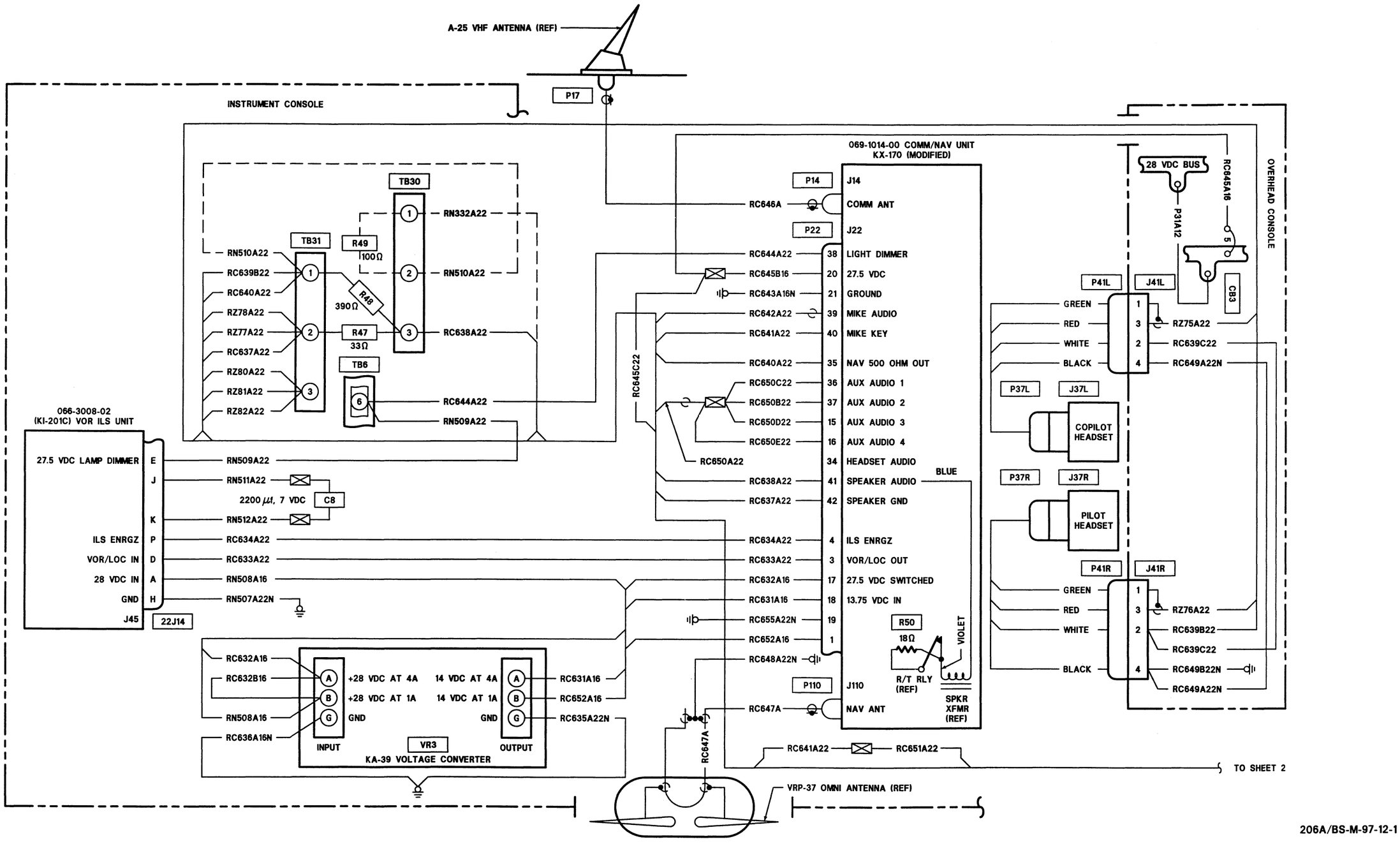


Figure 97-11. Transponder (KT-79) — troubleshooting chart

A B WIRING DIAGRAMS

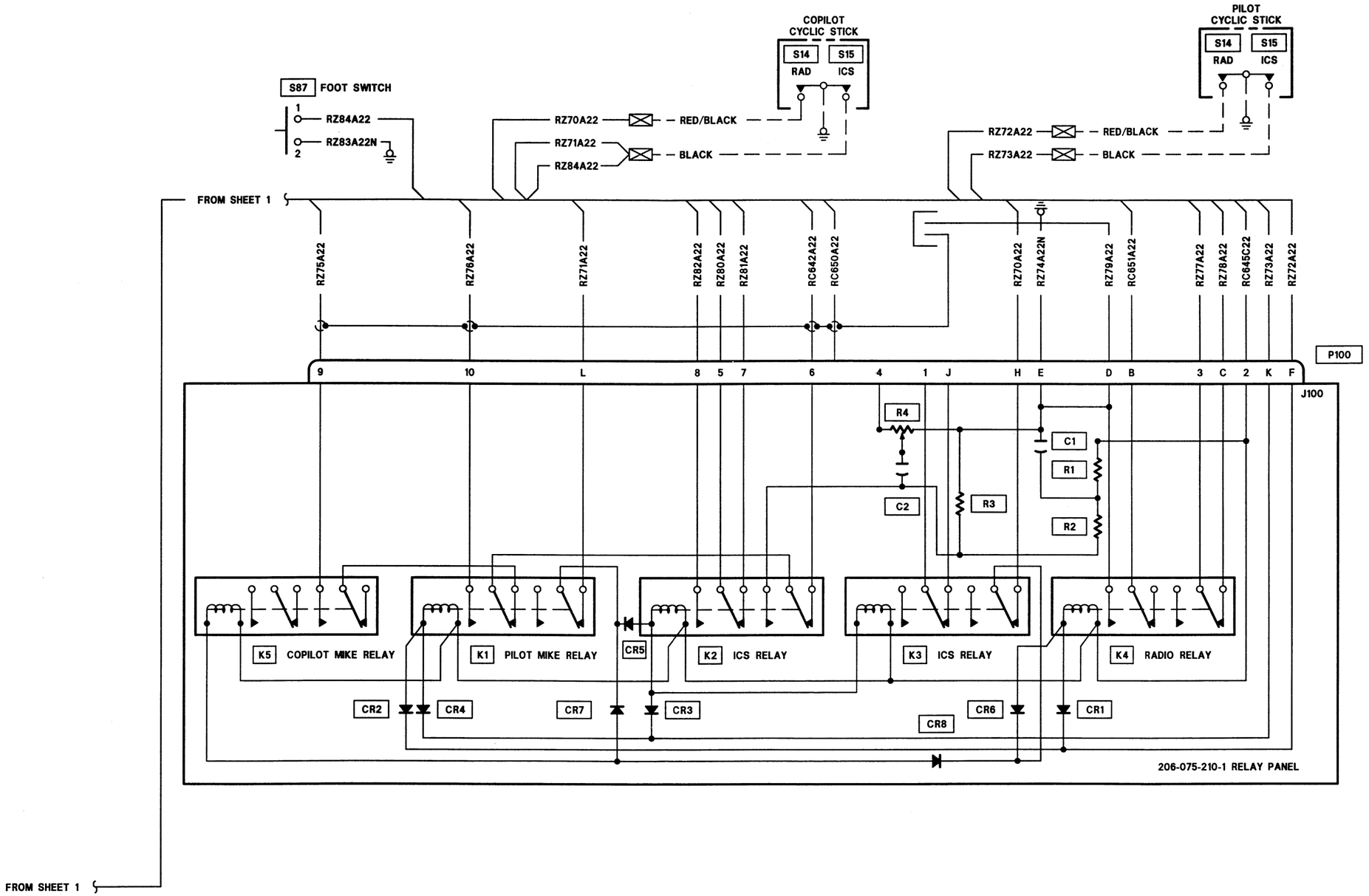
97-13. AVIONICS SYSTEMS WIRING DIAGRAMS (Helicopters S/N 4 through 2211).

This section contains wiring diagrams for each of the avionics systems that may be installed in Models 206A JetRanger and 206B JetRanger II (figures 97-12 through 97-19). Individual circuit diagrams are provided to assist maintenance personnel in understanding the circuits and components installed in the helicopter and in troubleshooting and tracing of inoperative and malfunctioning circuits and components.



206A/BS-M-97-12-1

Figure 97-12. KX-170 VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 1 of 2)



206A/BS-M-97-12-2

Figure 97-12. KX-170 VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 2)

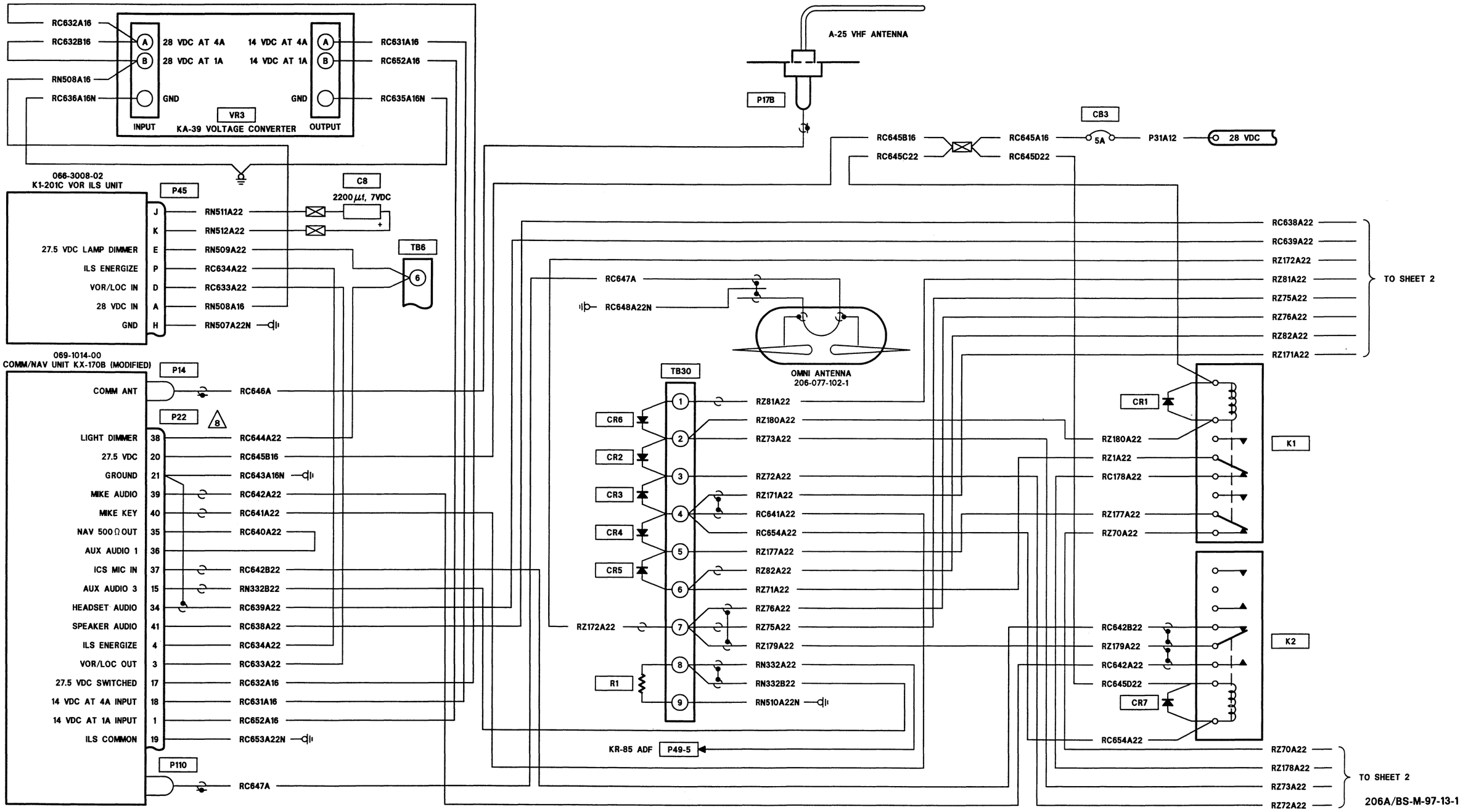
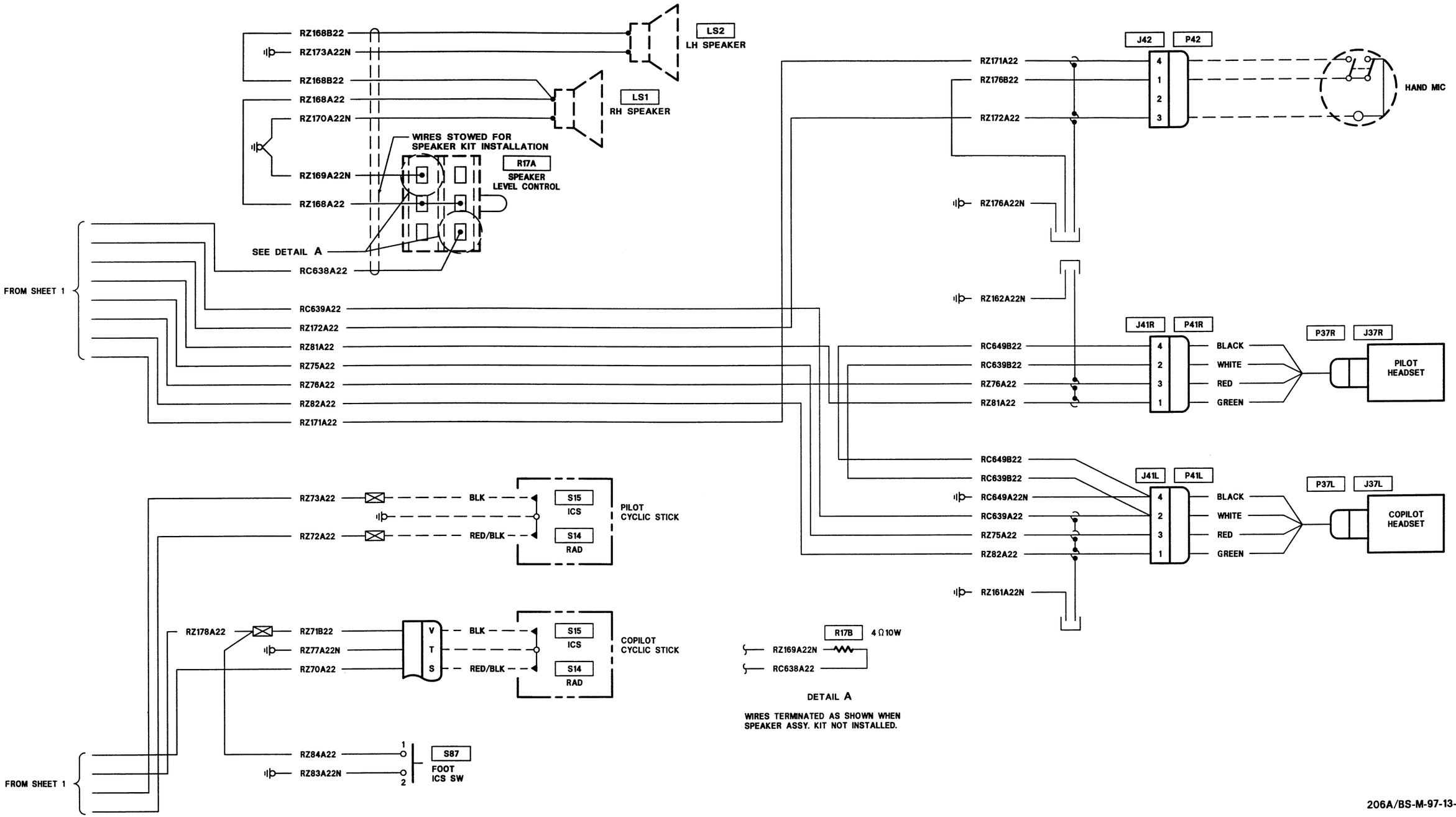
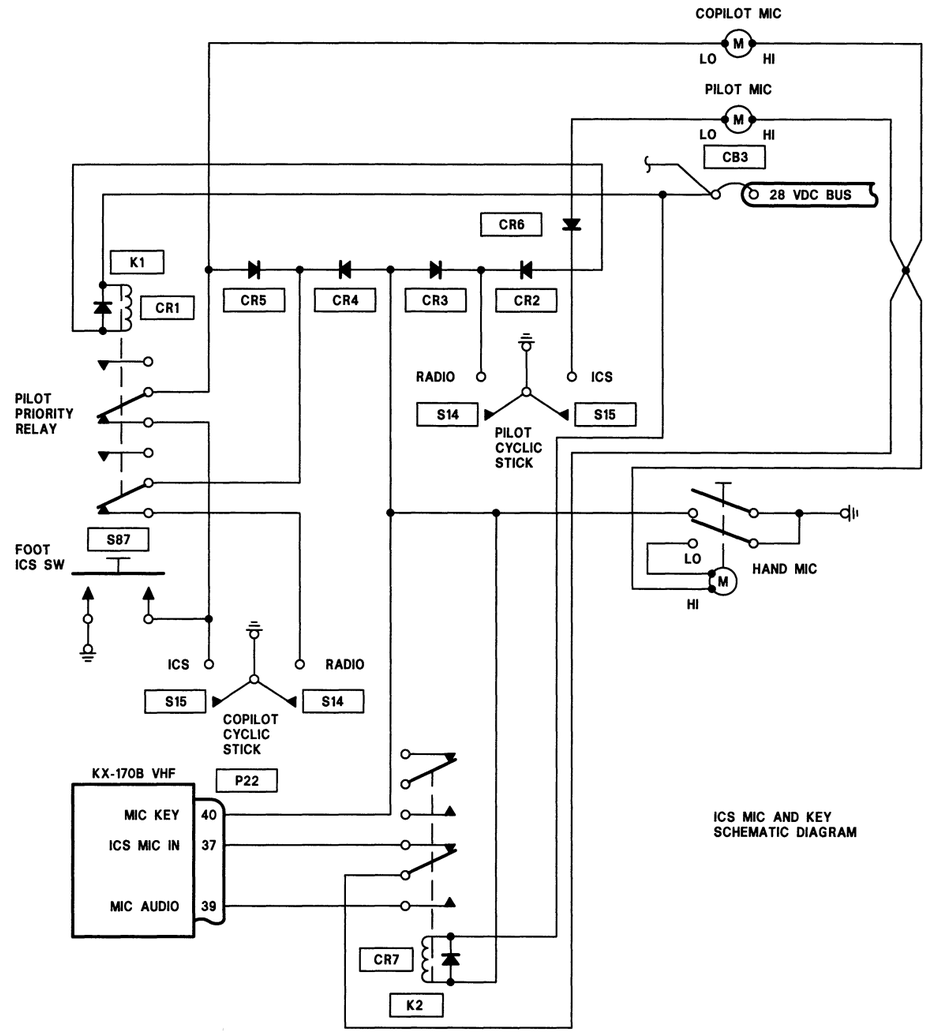


Figure 97-13. KX-170B VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 1 of 3)



206A/BS-M-97-13-2

Figure 97-13. KX-170B VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 2)



ICS MIC AND KEY
SCHEMATIC DIAGRAM

206A/BS-M-97-13-3

Figure 97-13. KX-170B VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 3)

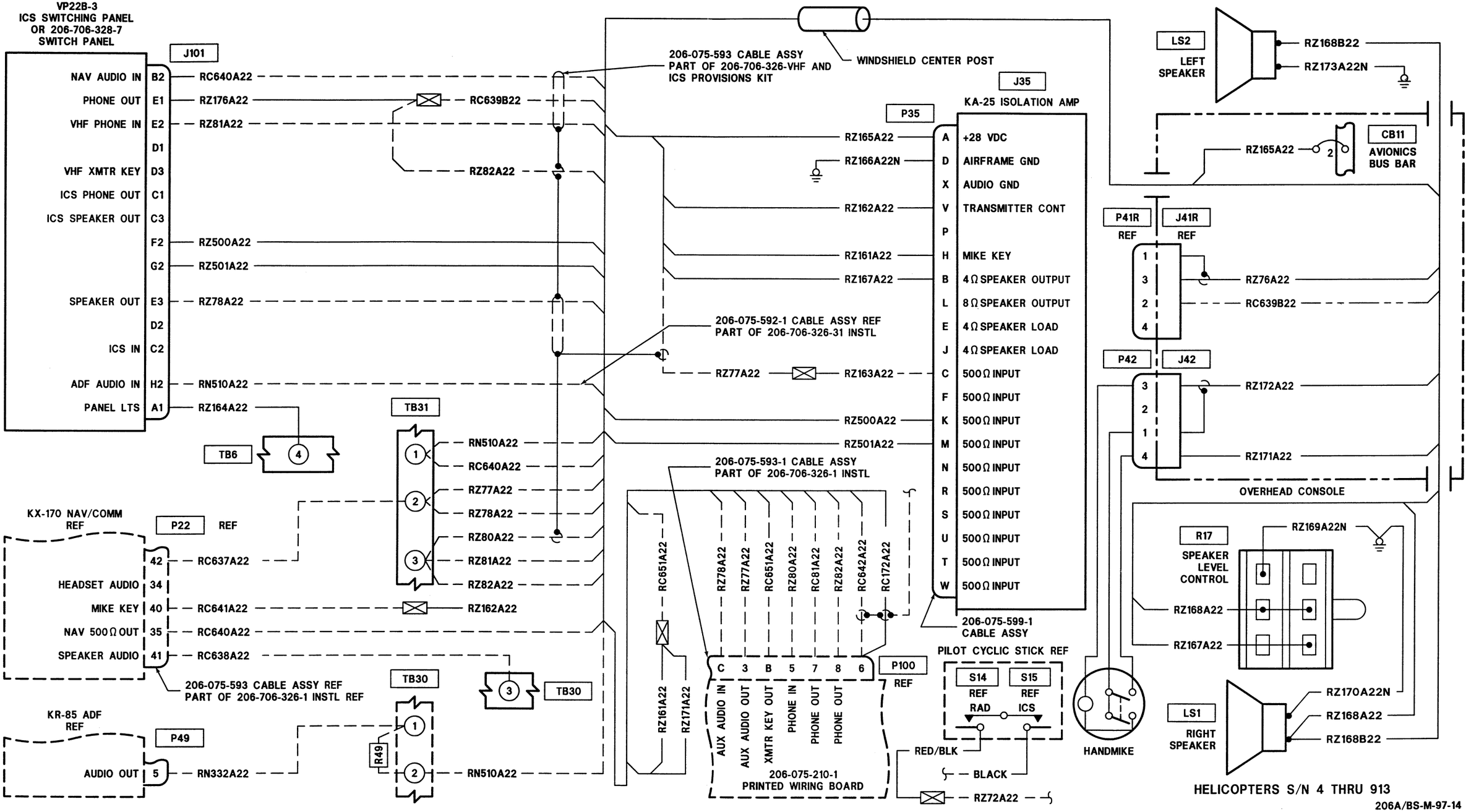


Figure 97-14. Auxiliary speaker — wiring diagram

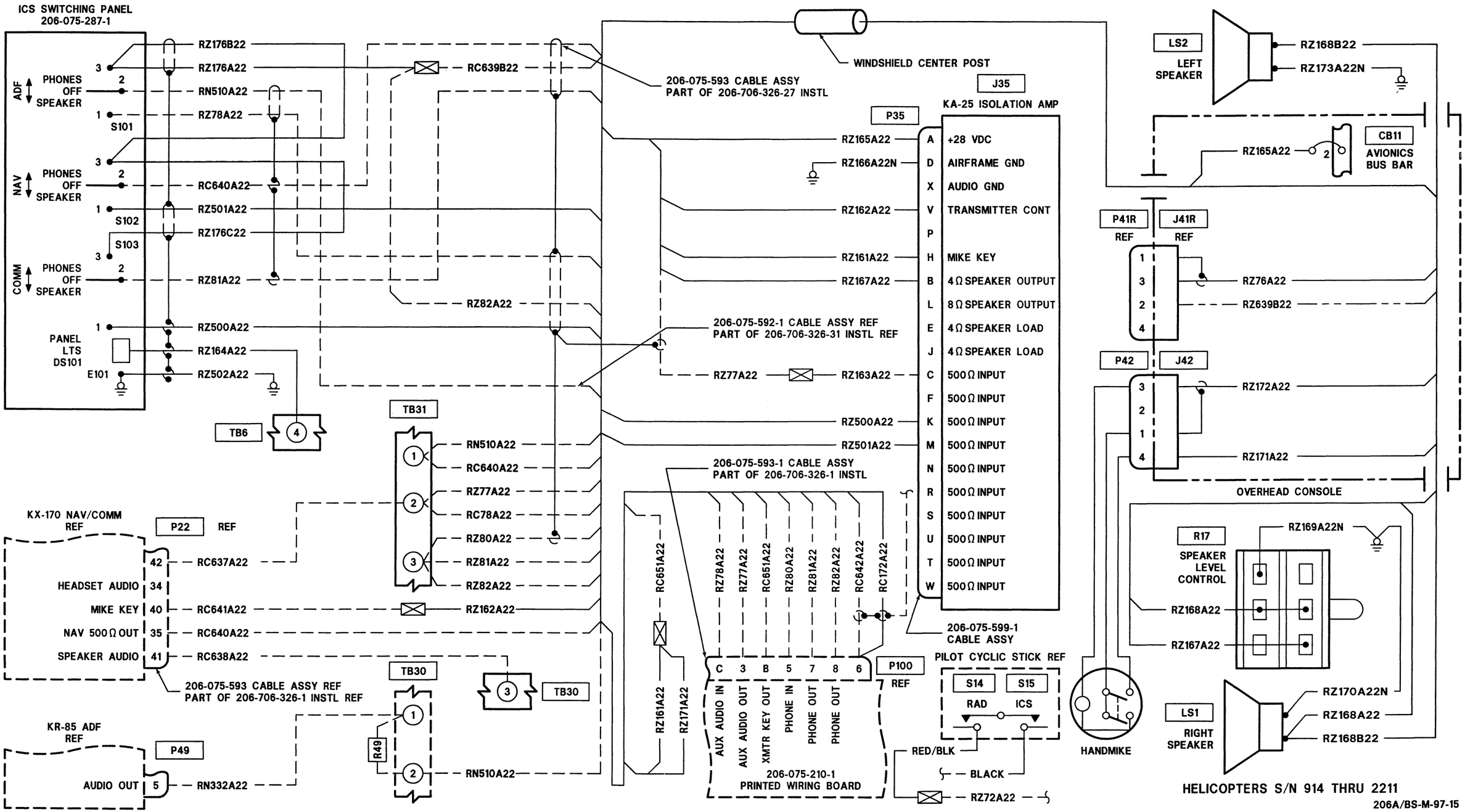


Figure 97-15. Auxiliary speaker — wiring diagram

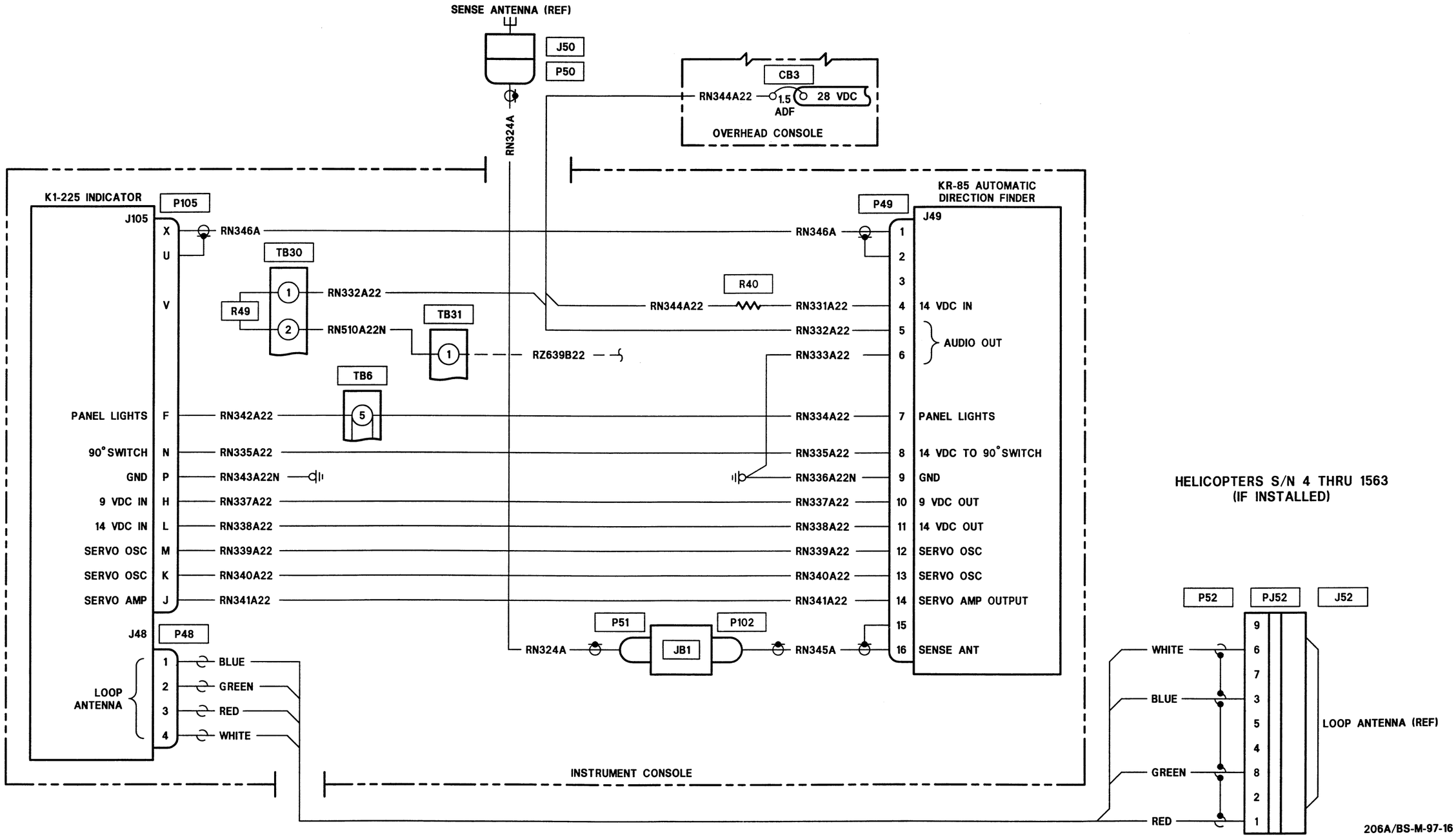


Figure 97-16. KR-85 ADF with KI-225 indicator — wiring diagram

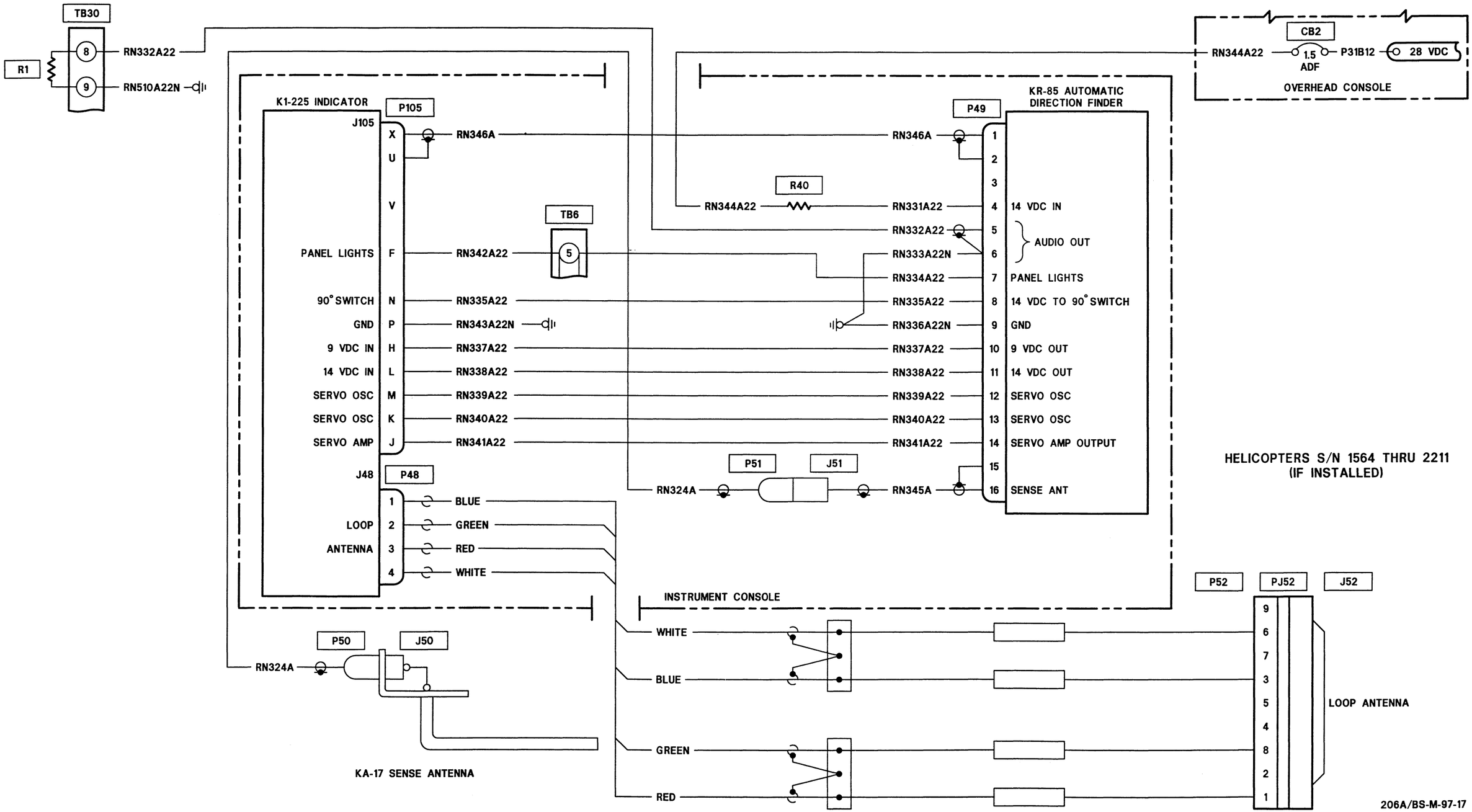


Figure 97-17. KR-85 ADF with KI-225 indicator — wiring diagram

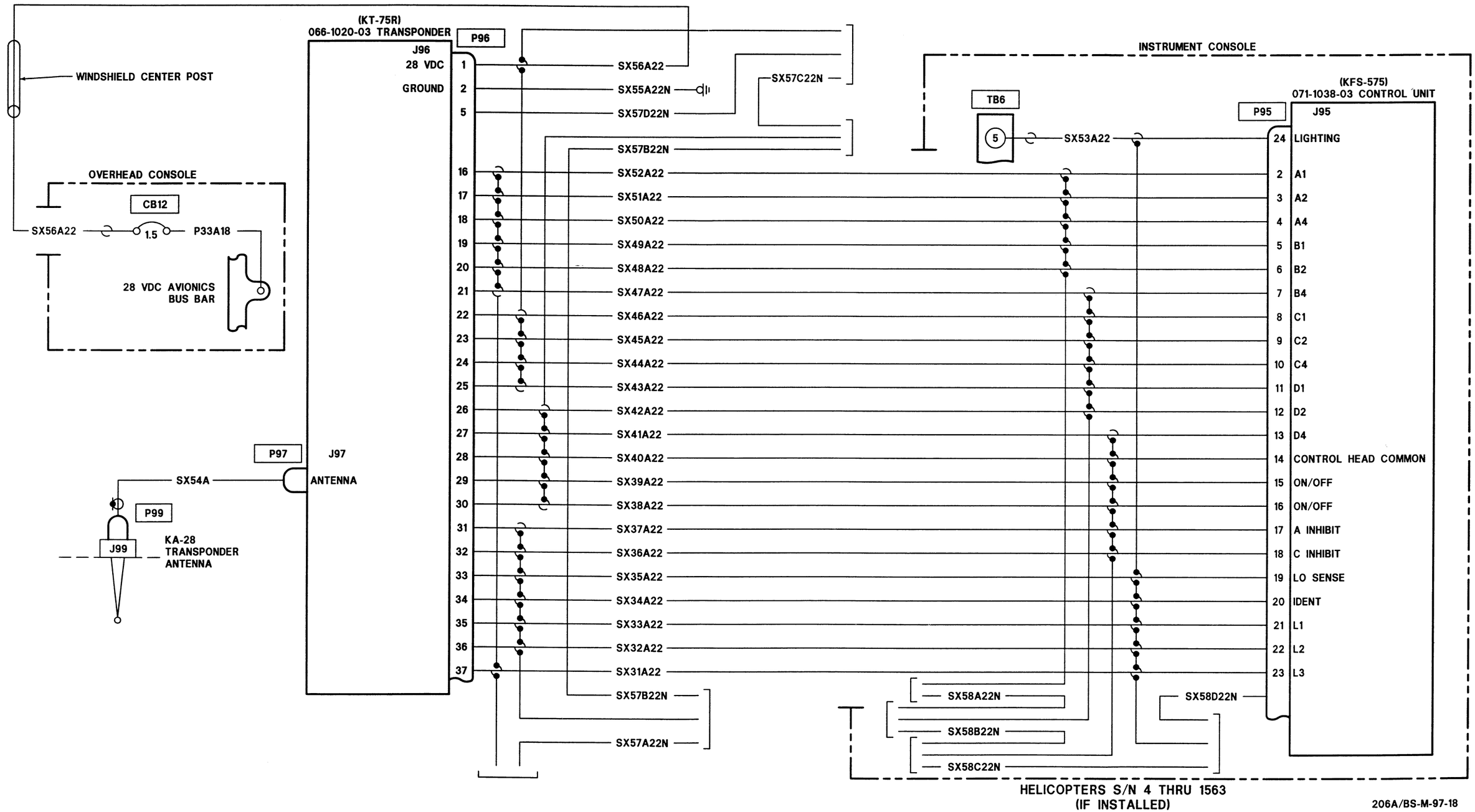
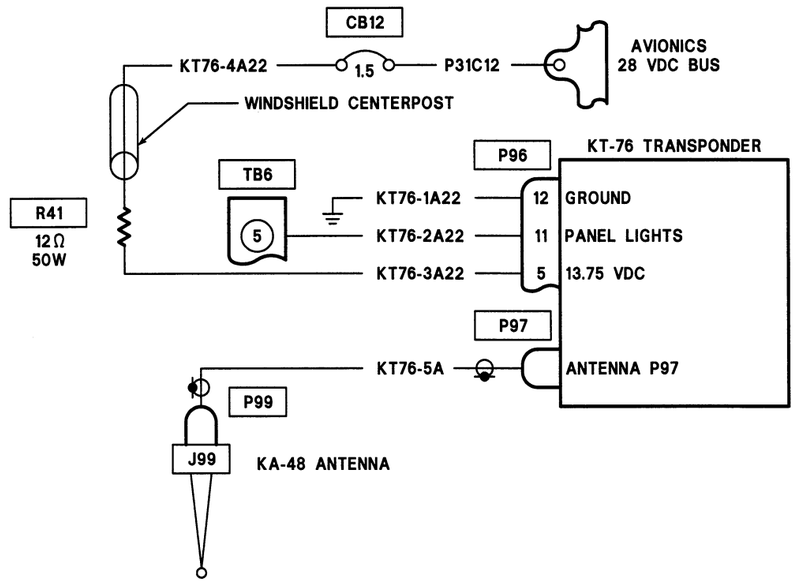


Figure 97-18. KT-75R transponder — wiring diagram



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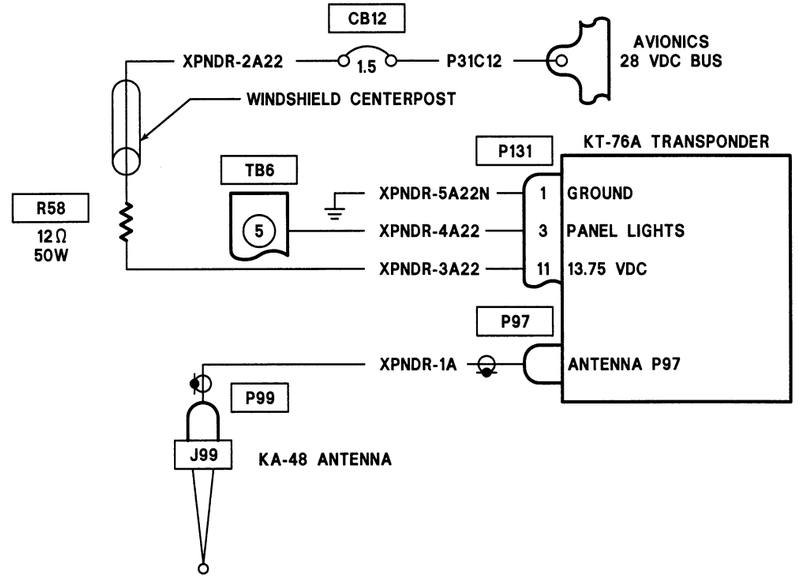

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206A/BS-M-97-19

Figure 97-19. KT-76/KT-76A transponder — wiring diagram

B3 WIRING DIAGRAMS

97-14. AVIONICS SYSTEMS WIRING DIAGRAMS (Helicopters S/N 3217 and subsequent).

This section contains wiring diagrams (figures 97-20 through 97-30) for each of the avionics systems which are installed in the Model 206B JetRanger III, helicopters S/N 3217 and subsequent. Circuit diagrams are provided to assist maintenance personnel in understanding operation of circuits and components, and in troubleshooting malfunctions. These diagrams are indexed to coincide as nearly as possible with text and troubleshooting charts.

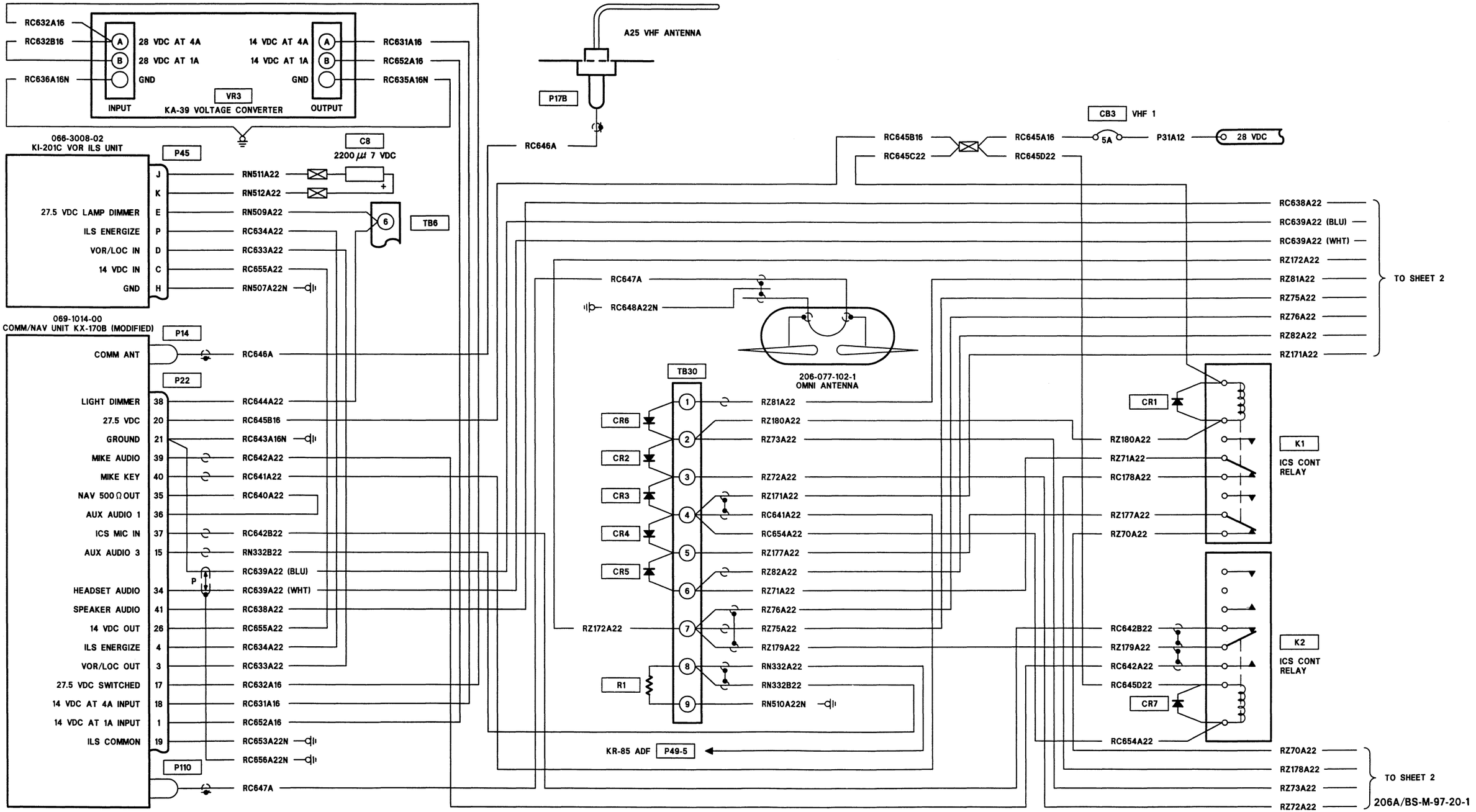
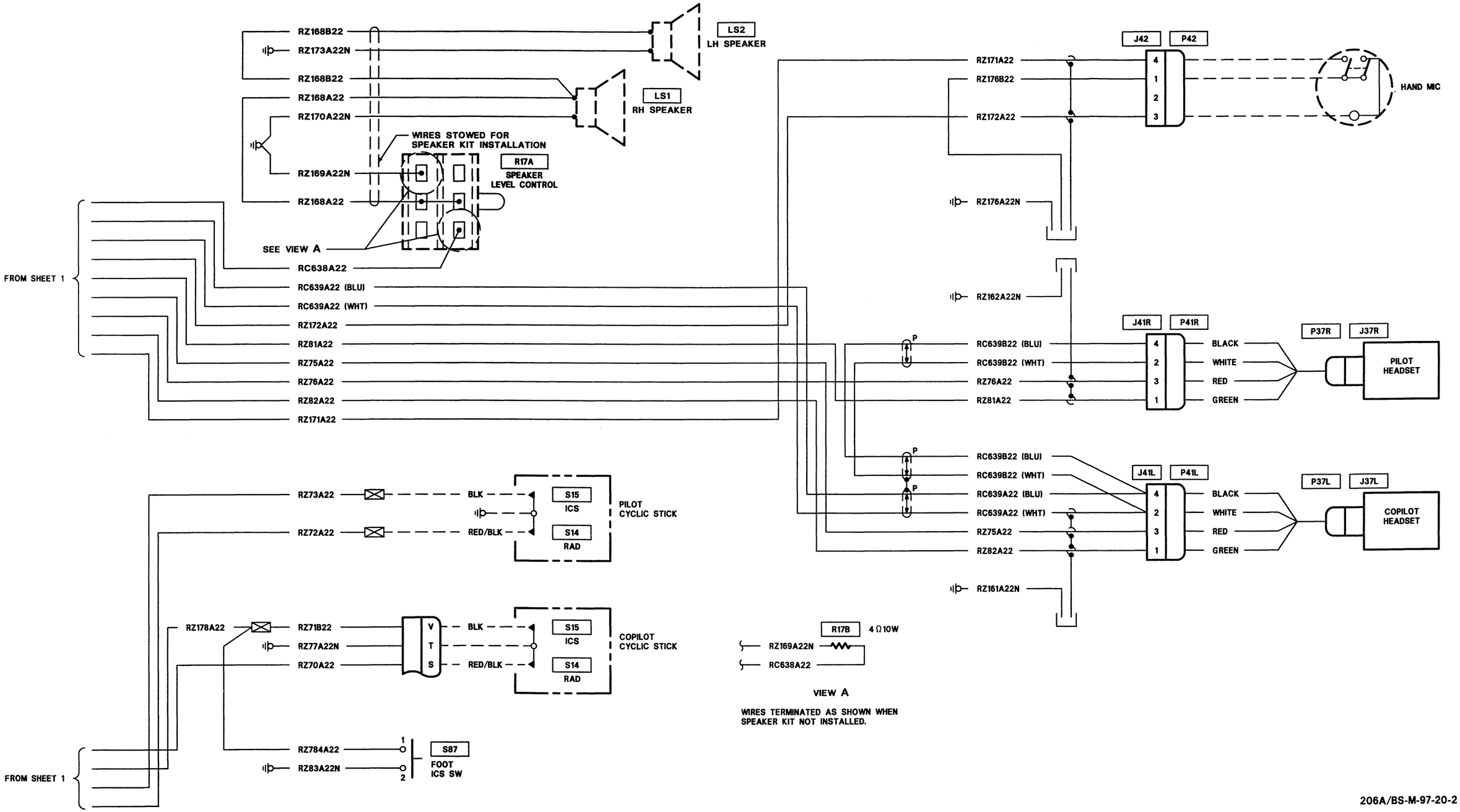
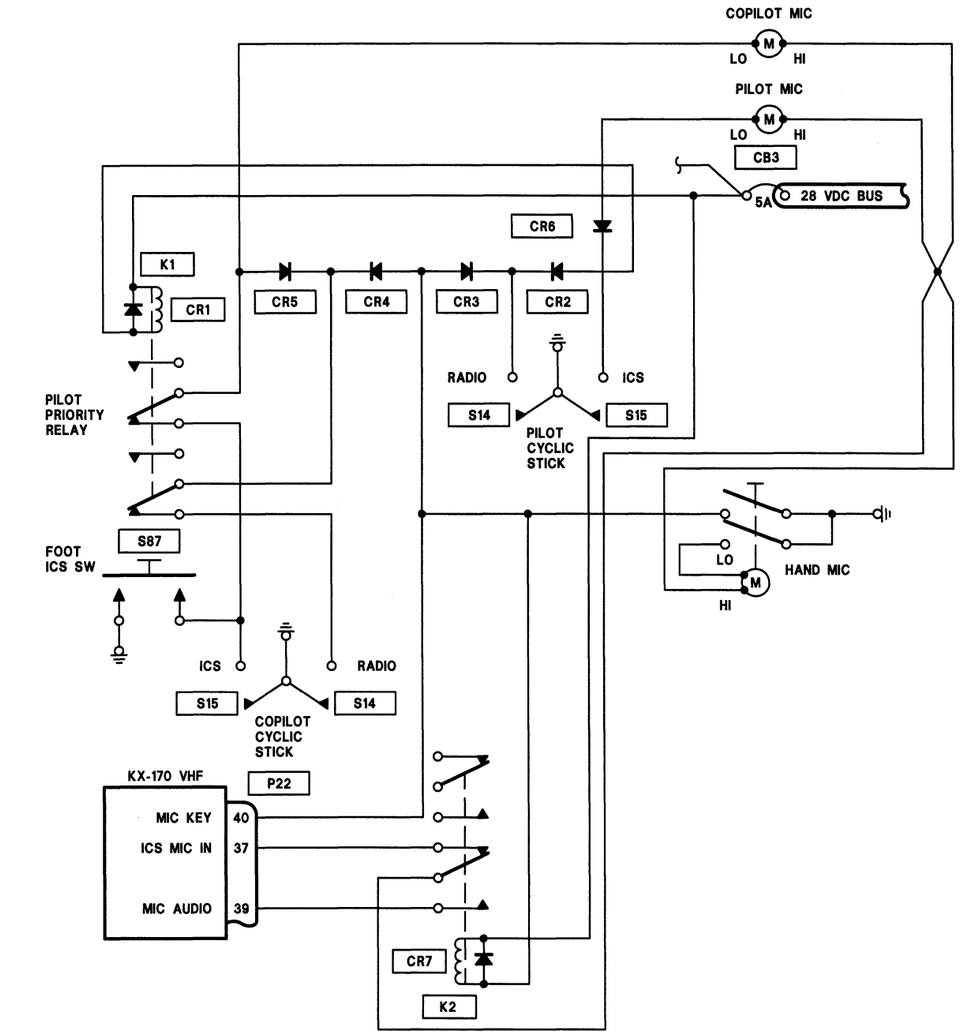


Figure 97-20. KX-170B VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 1 of 3)



206A/BS-M-97-20-2

Figure 97-20. KX-170B VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 2)



206A/BS-M-97-20-3

Figure 97-20. KX-170B VHF COMM/NAV/ICS transceiver with KI-201C OMNI indicator — wiring diagram (Sheet 3)

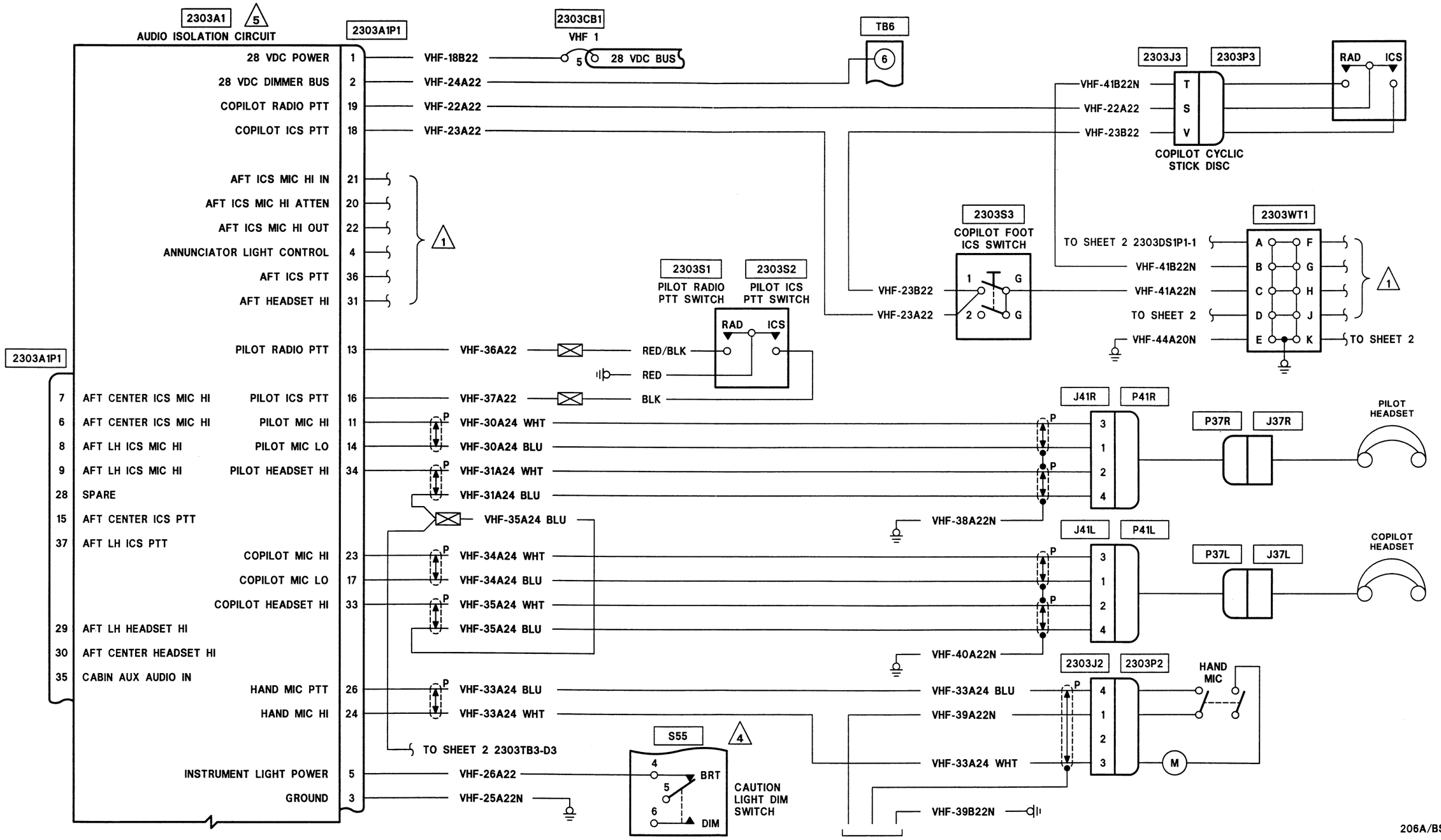


Figure 97-21. KX-155 VHF COMM/NAV/ICS transceiver with KI-208 OMNI indicator — wiring diagram (Sheet 1 of 4)

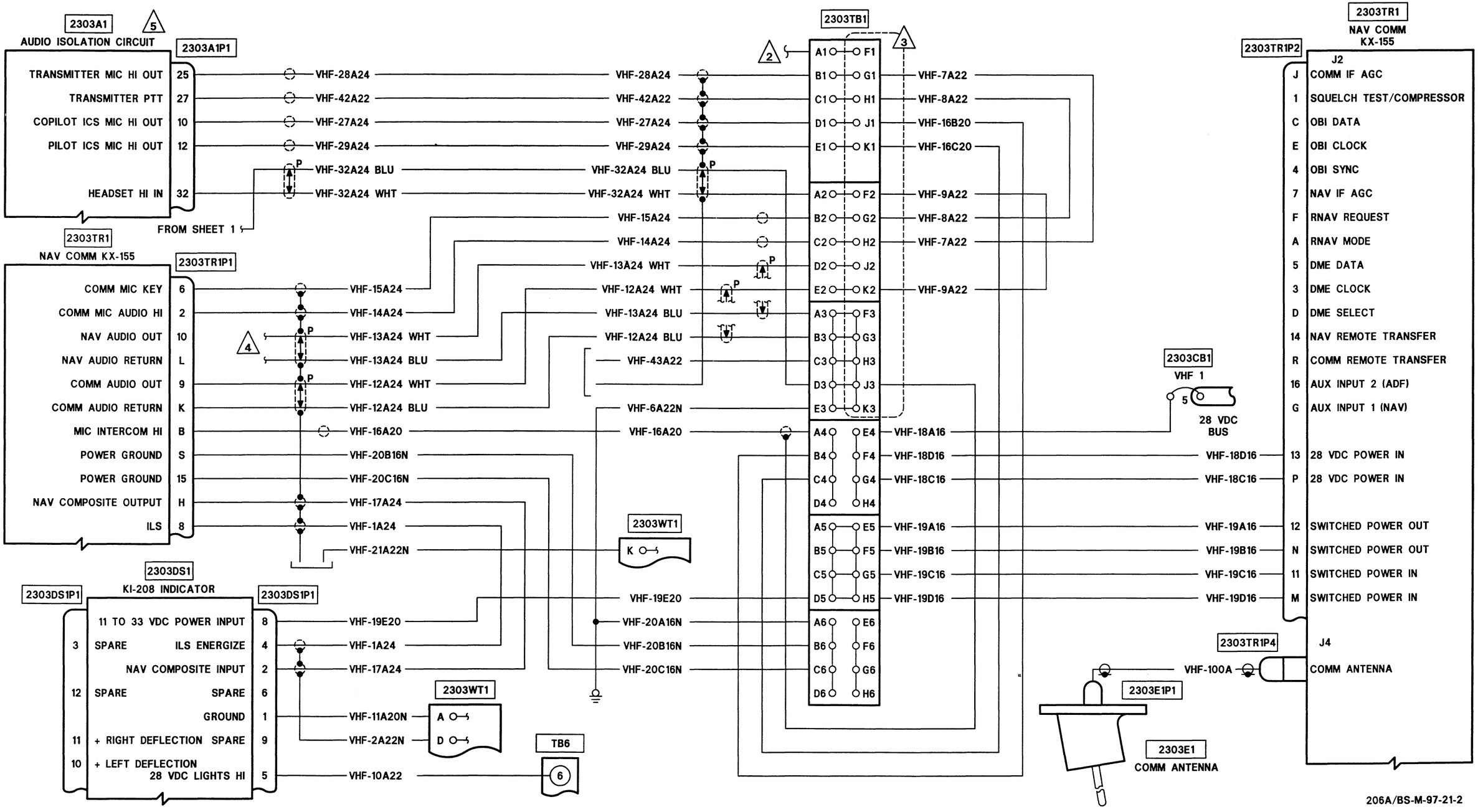


Figure 97-21. KX-155 VHF COMM/NAV/ICS transceiver with KI-208 OMNI indicator — wiring diagram (Sheet 2)

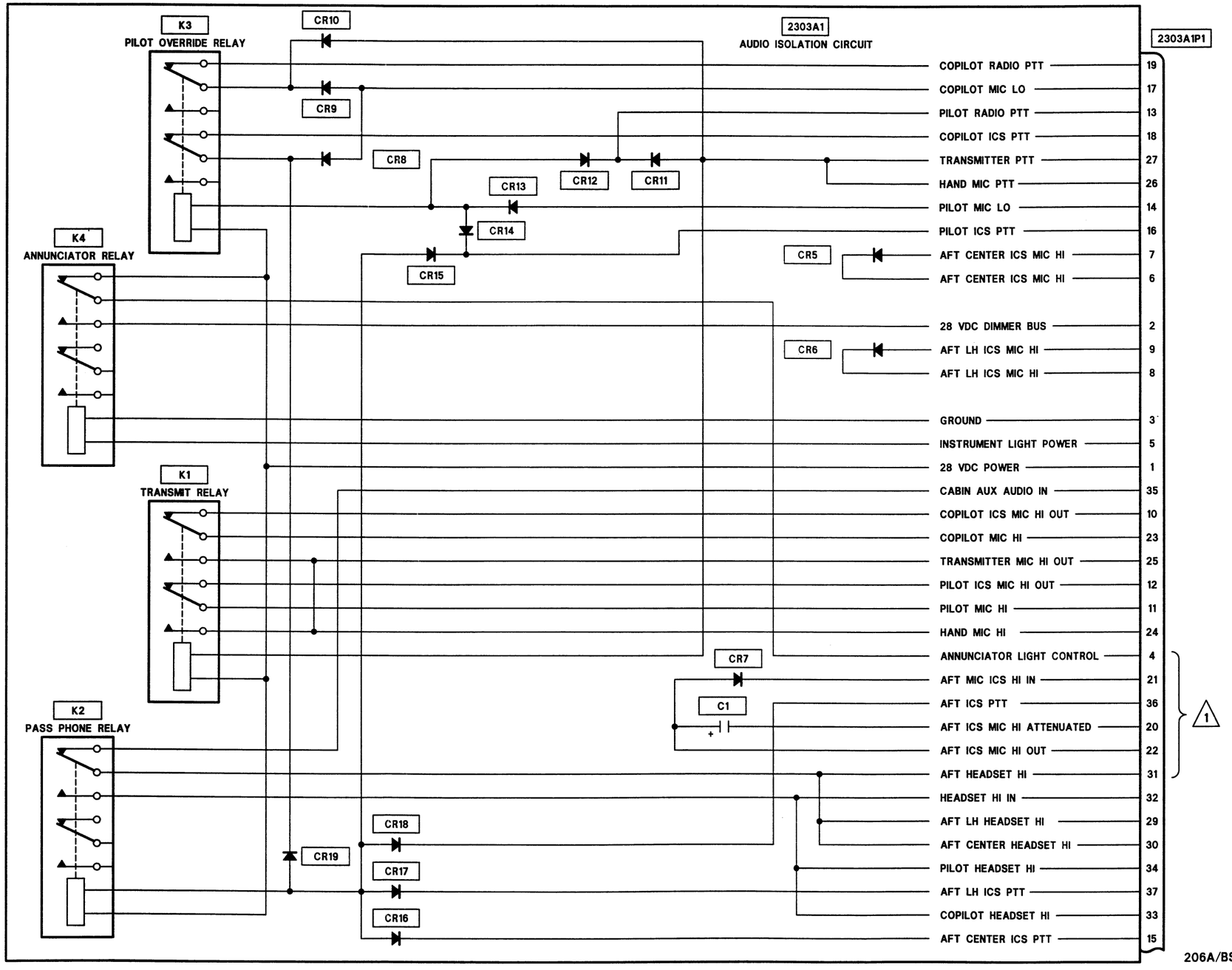


Figure 97-21. KX-155 VHF COMM/NAV/ICS transceiver with KI-208 OMNI indicator — wiring diagram (Sheet 3)

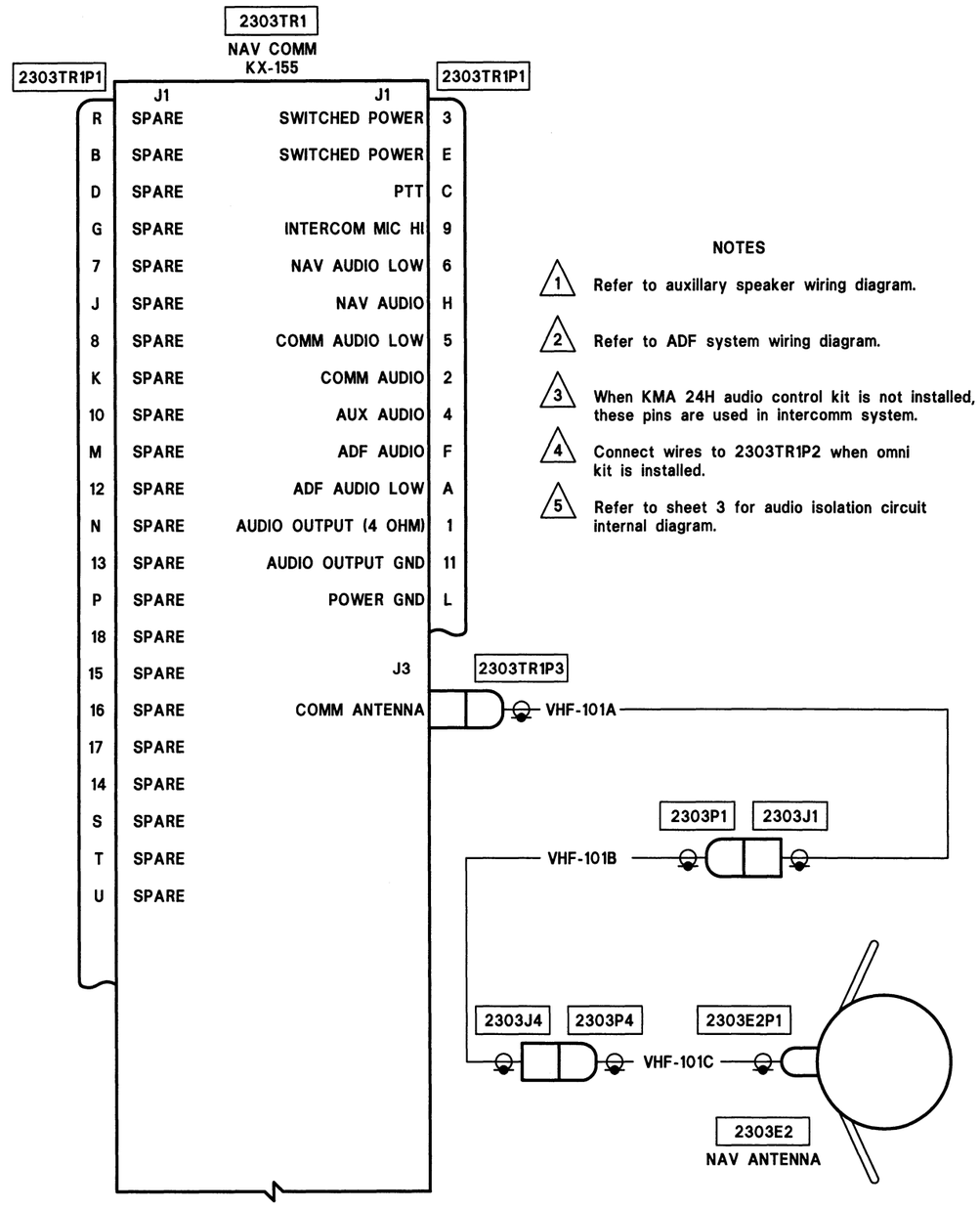


Figure 97-21. KX-155 VHF COMM/NAV/ICS transceiver with KI-208 OMNI indicator — wiring diagram (Sheet 4)

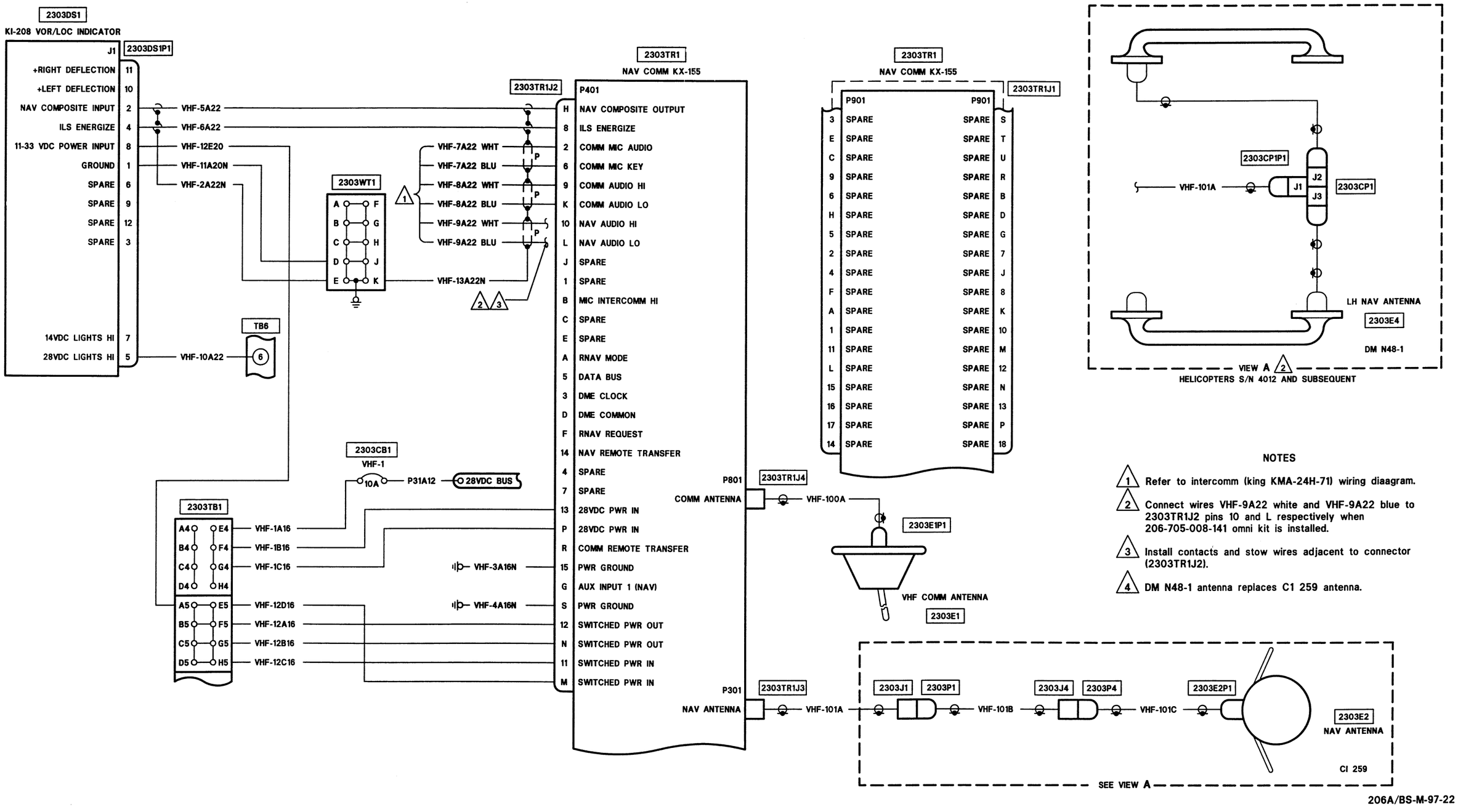


Figure 97-22. KX-155 VHF COMM/NAV/ICS transceiver with KI-208 VOR/LOC indicator — wiring diagram

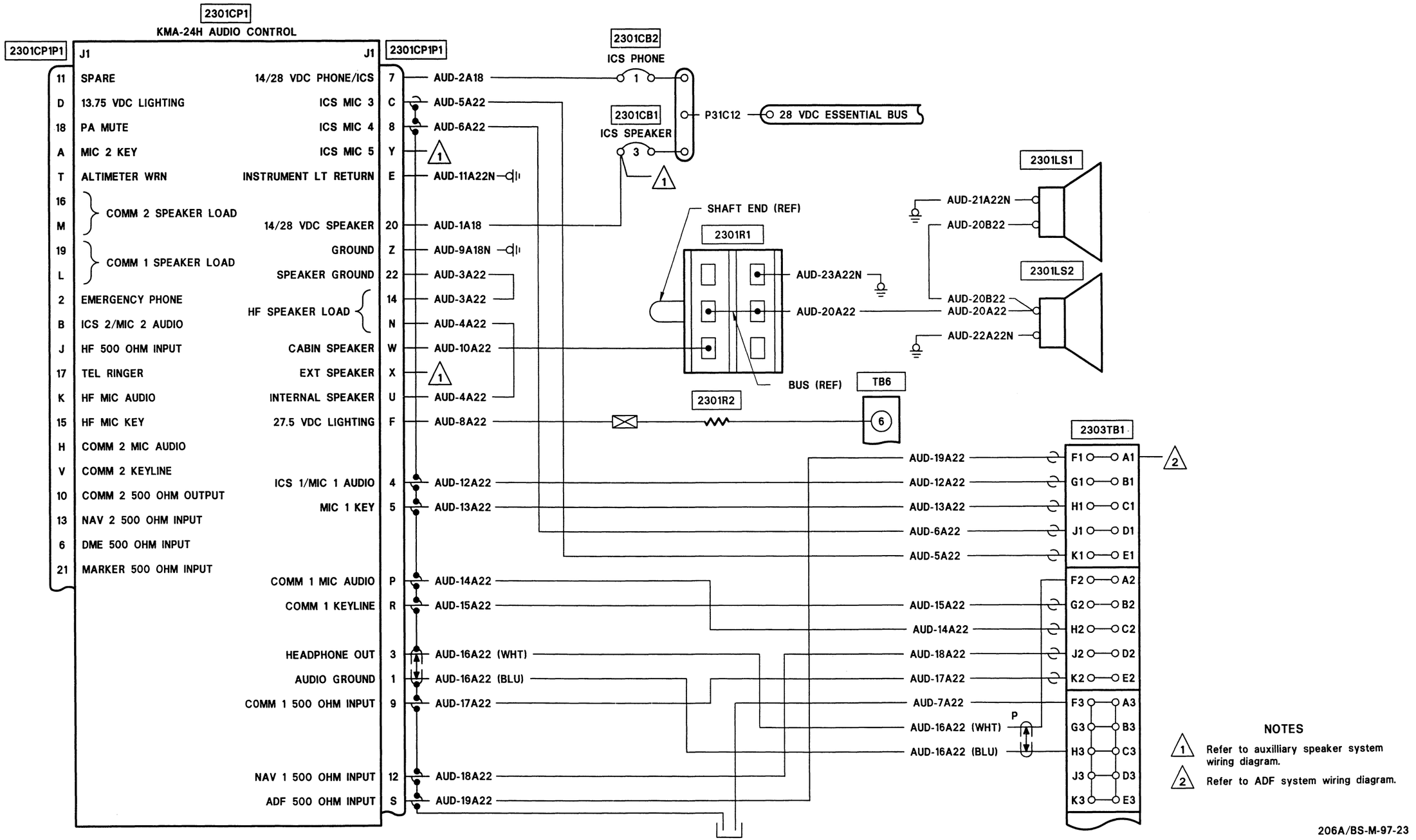


Figure 97-23. KMA-24H ICS audio control panel — wiring diagram

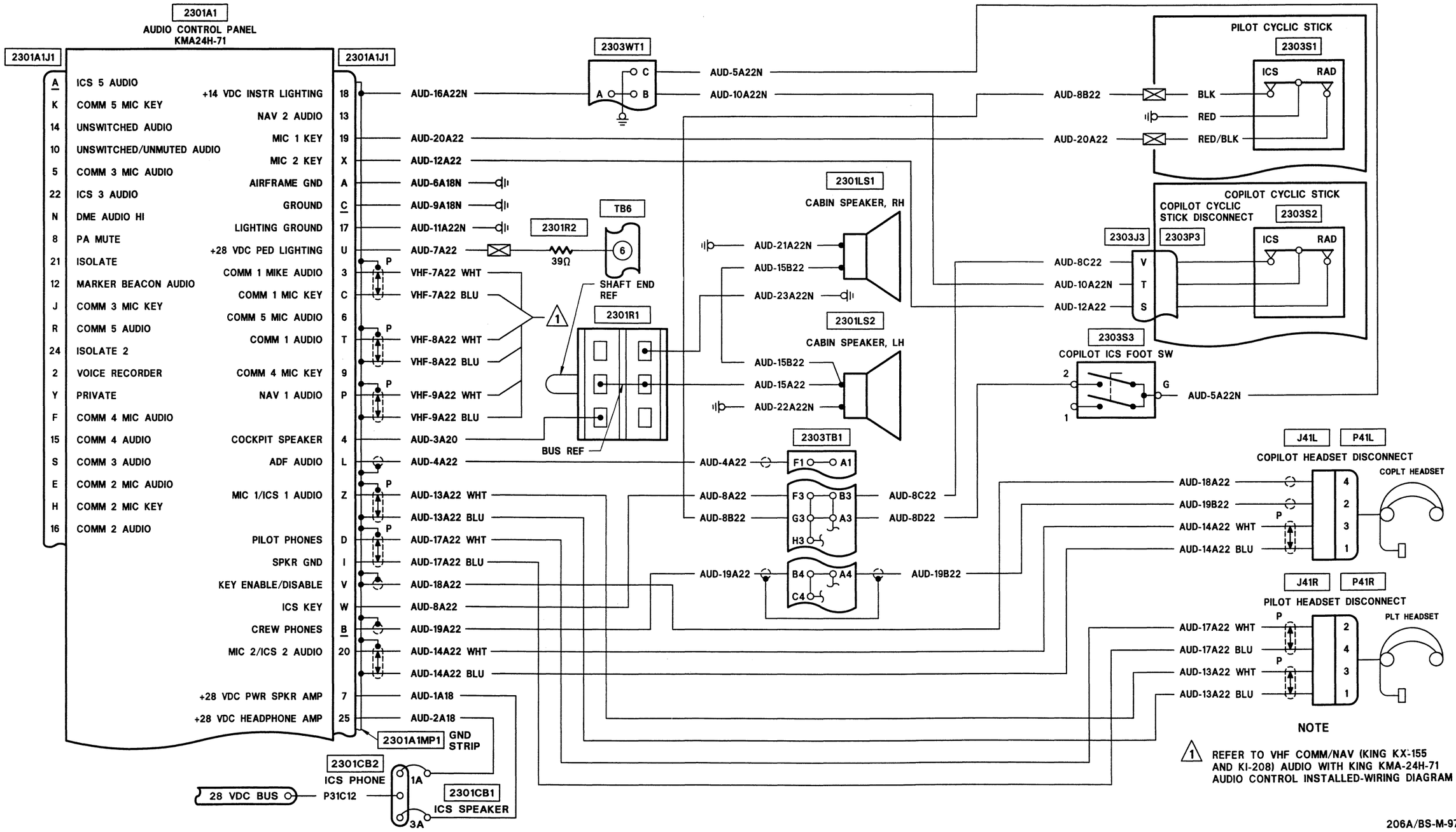


Figure 97-24. KMA-24H-71 ICS audio control panel — wiring diagram

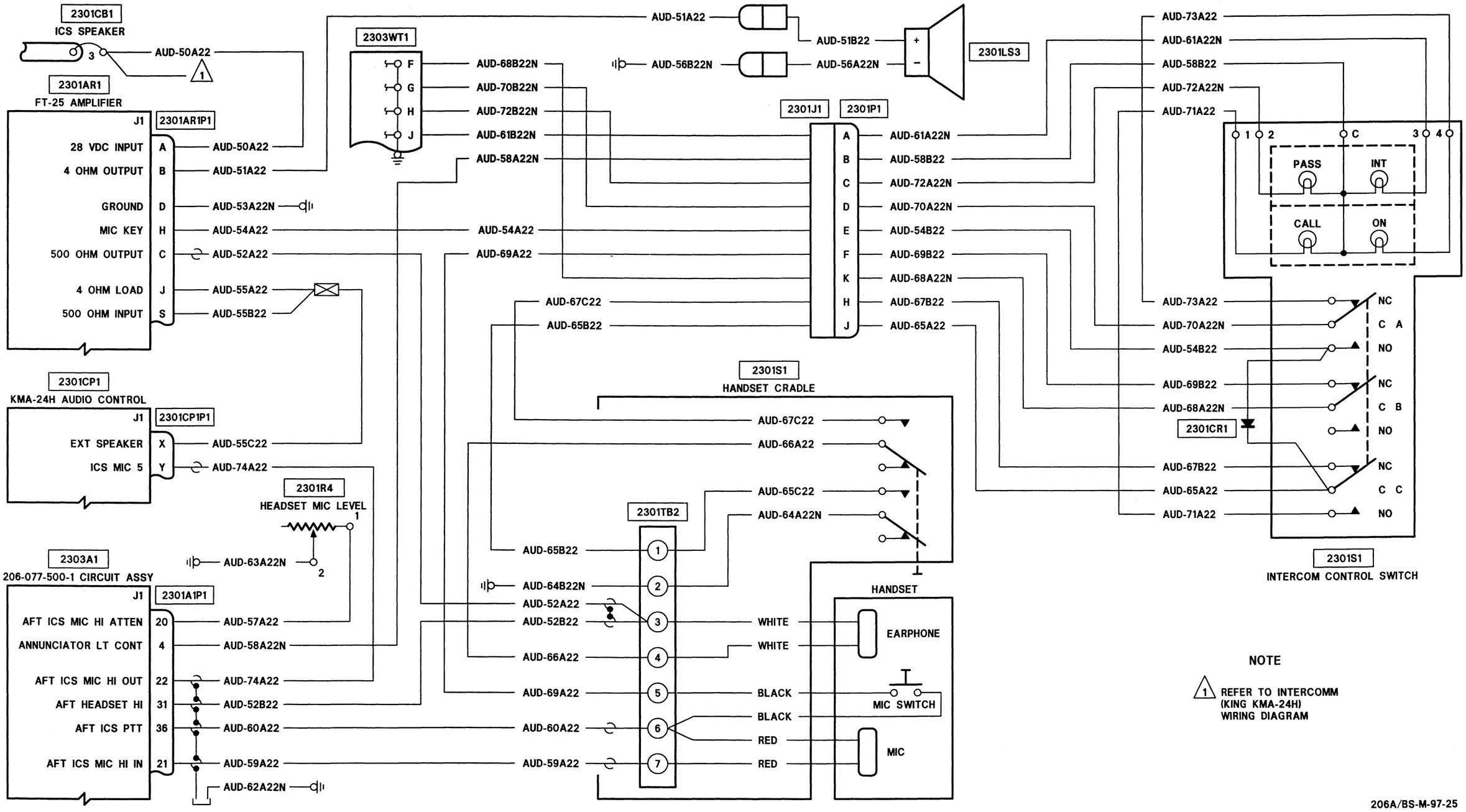
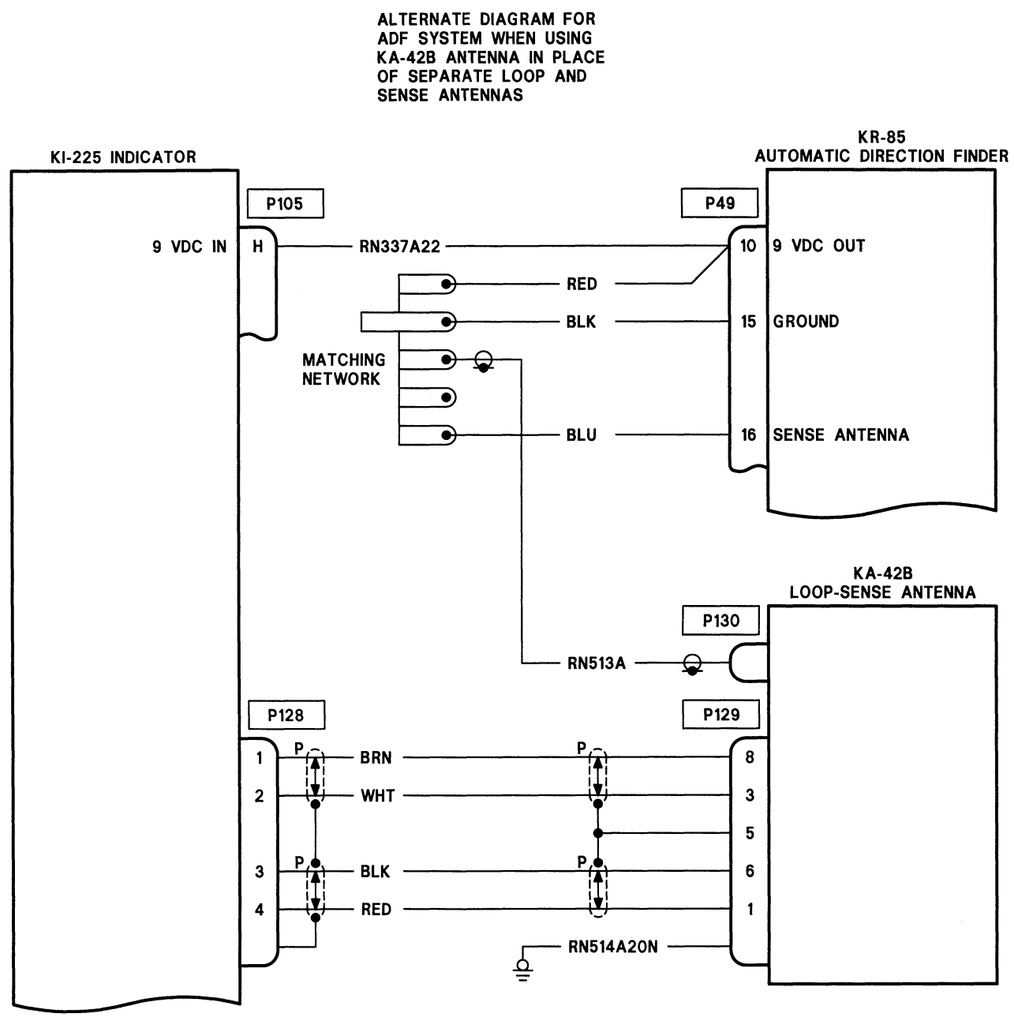


Figure 97-25. Auxiliary speaker — wiring diagram



206A/BS-M-97-26-1

Figure 97-26. KR-85 ADF with separate loop and sense antennas and with KA-42B loop-sense antenna — wiring diagram (Sheet 1 of 2)

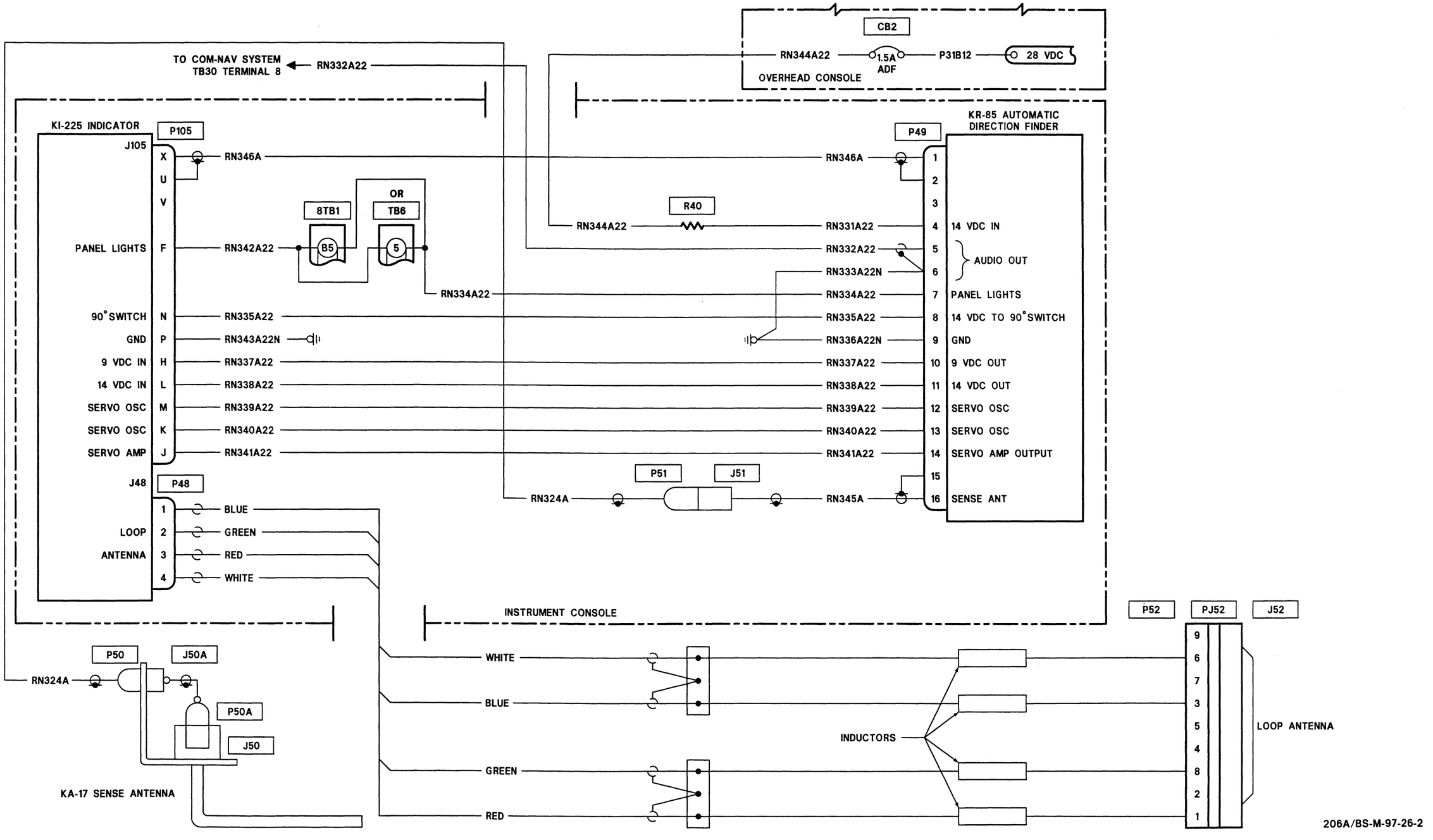
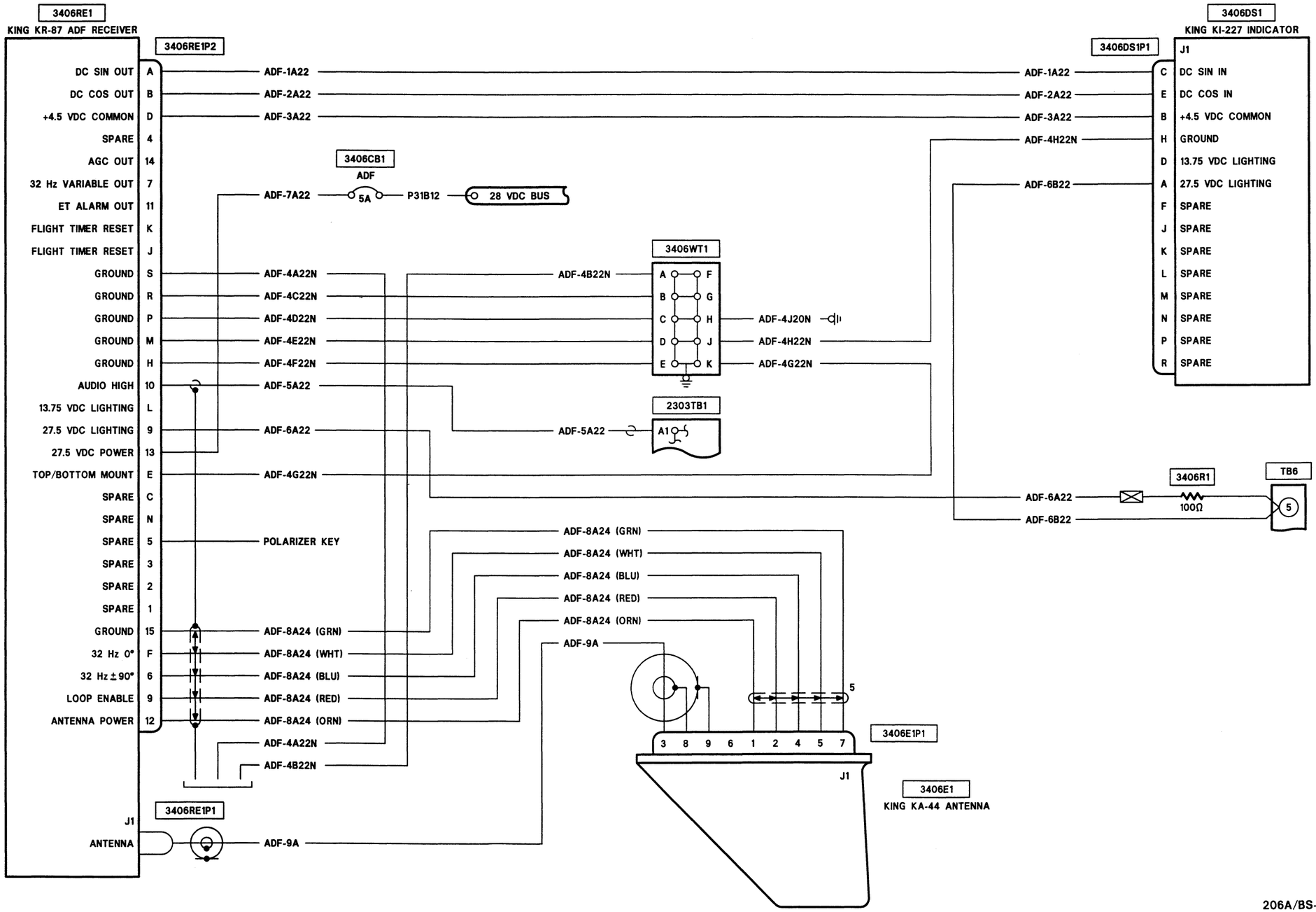
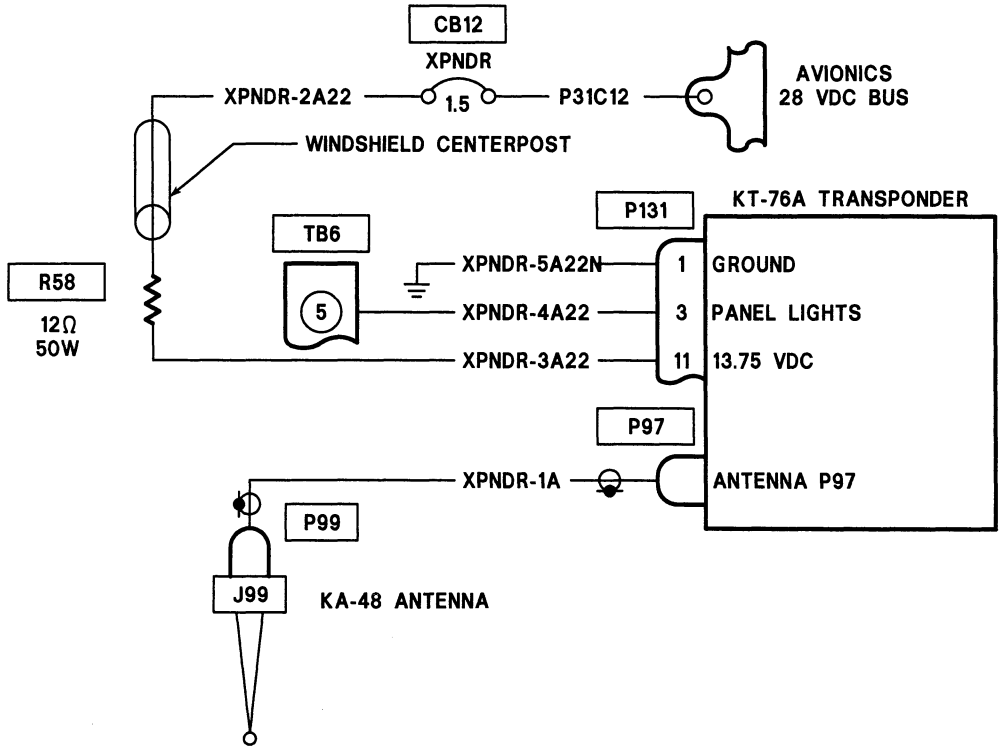


Figure 97-26. KR-85 ADF with separate loop and sense antennas and with KA-42B loop-sense antenna — wiring diagram (Sheet 2)



206A/BS-M-97-27

Figure 97-27. KR-87 ADF and KI-227 indicator — wiring diagram



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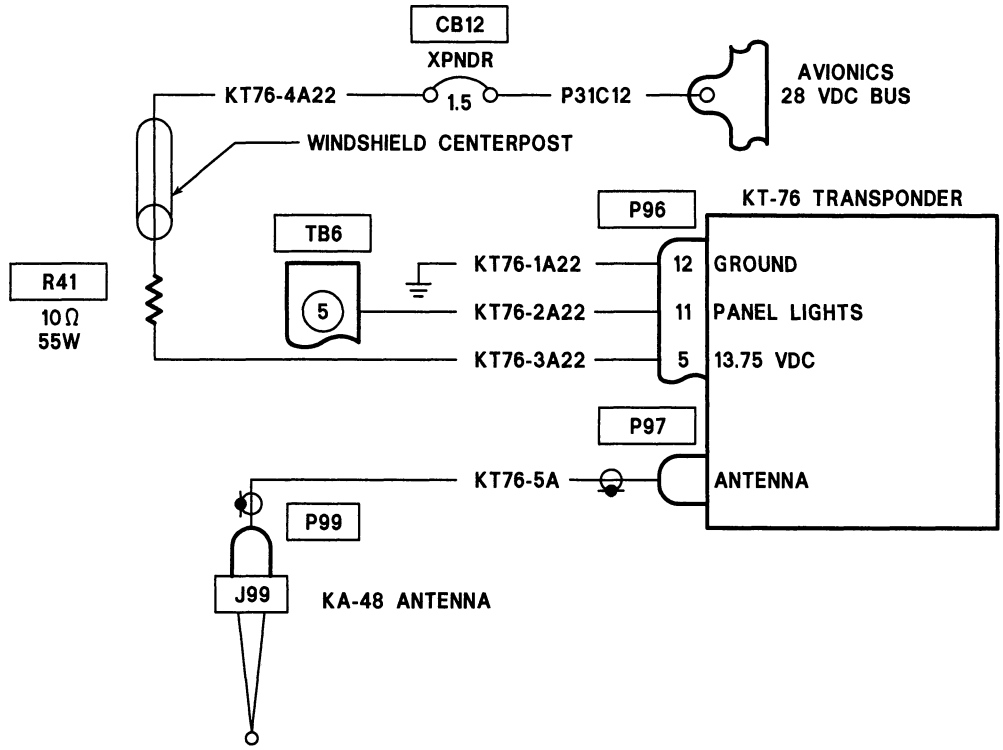

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Figure 97-28. KT-76/KT-76A transponder — wiring diagram

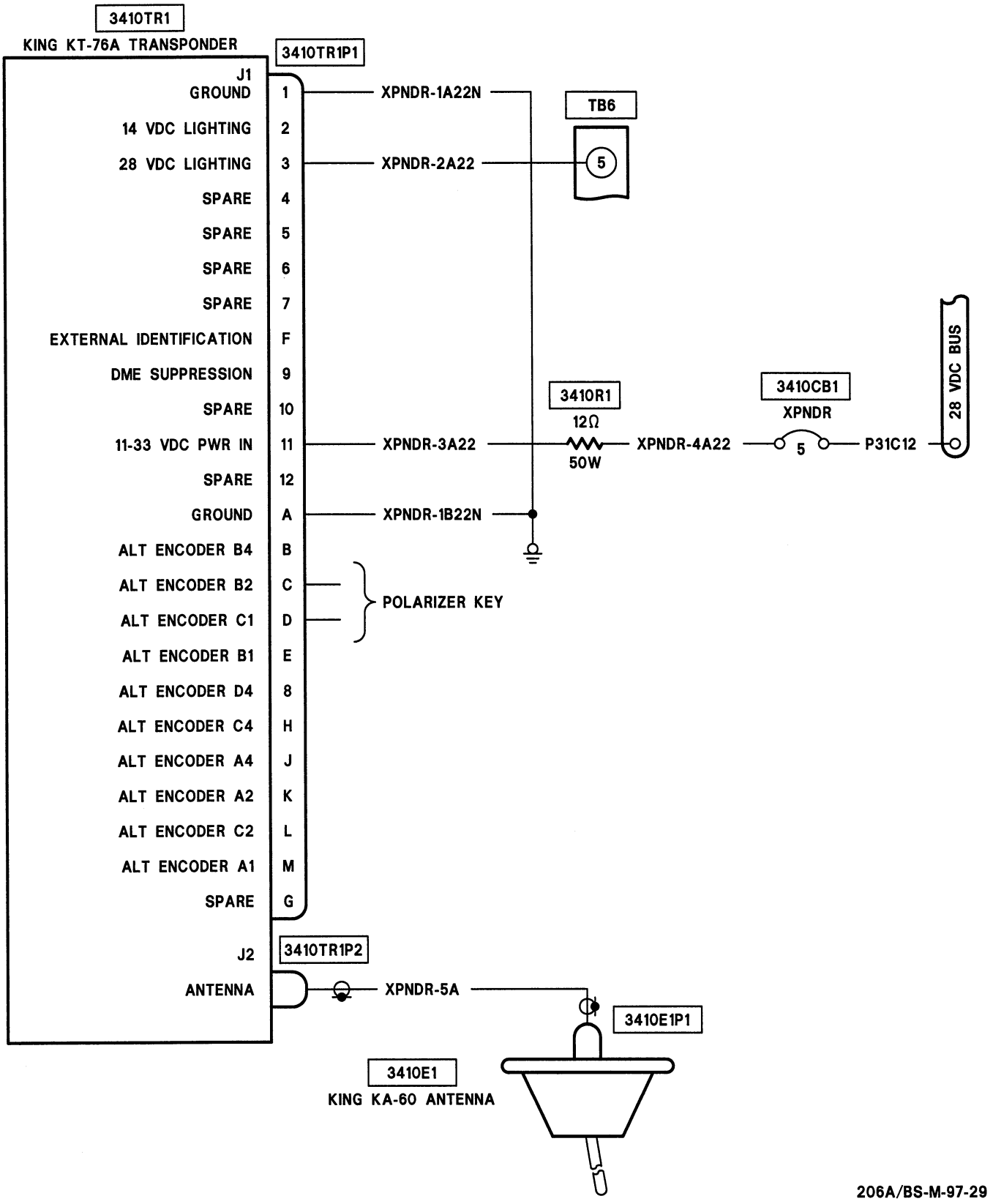

Figure 97-29. KT-76A transponder — wiring diagram

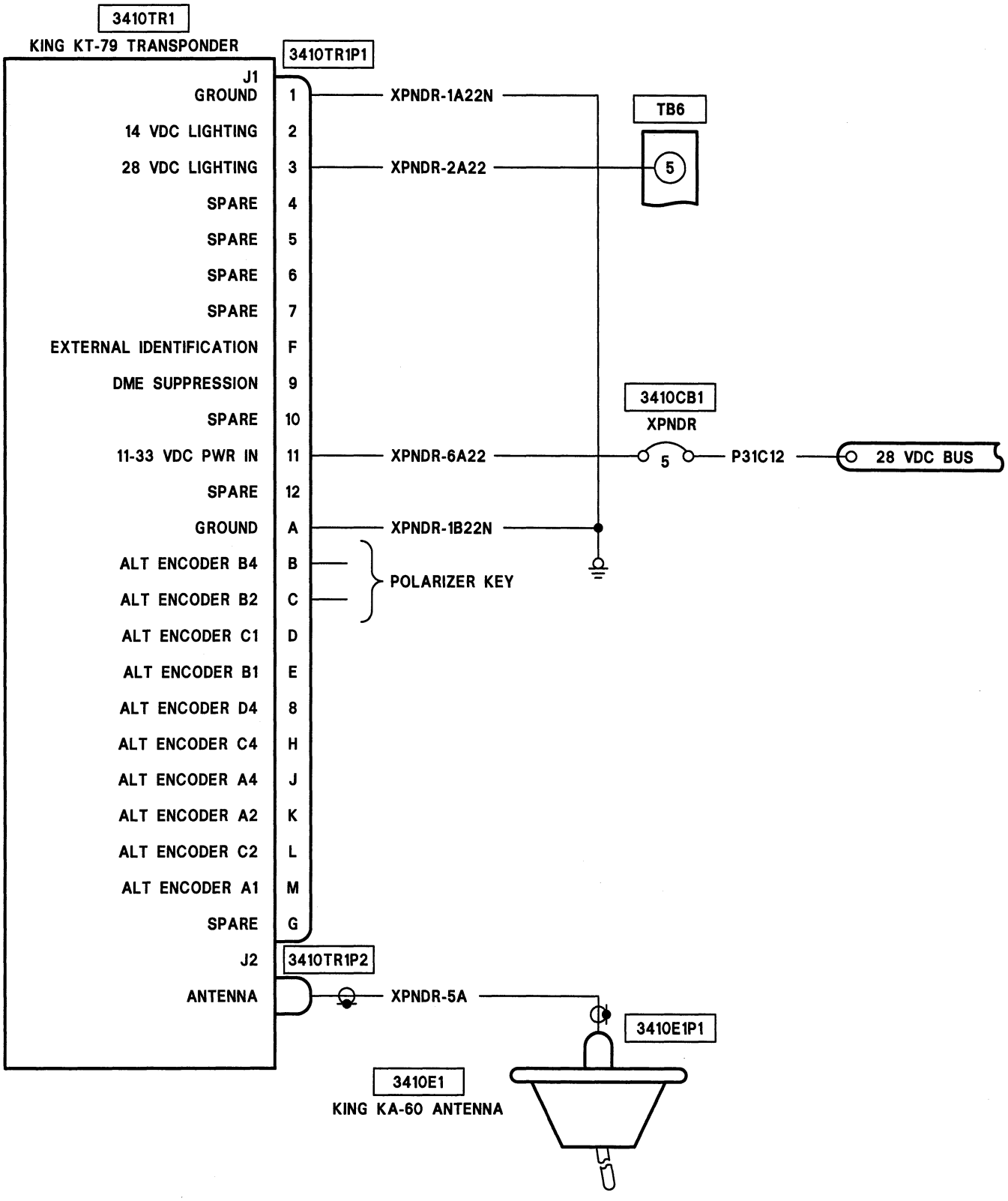

Figure 97-30. KT-79 transponder — wiring diagram